CONNEXIONS

MATHEMATICS

VI

Mathematics Grade 6

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Chapter 1

Term 1

1.1 To perform mental calculations[1]

1.1.1 MATHEMATICS

1.1.2 Number Concept

1.1.3

1.1.4 EDUCATOR SECTION

1.1.5 Memorandum

1. NUMBER CONCEPT
   - 1.1 27
   - 1.2 79
   - 1.3 96
   - 1.4 63
   - 1.5 42.5
   - 1.6 3.2
   - 1.7 100
   - 1.8 300
   - 1.9 294
   - 1.10 992
   - 1.11 8
   - 1.12 55
   - 1.13 63
   - 1.14 +
   - 1.15 445

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[1] This content is available online at <http://cnx.org/content/m20127/1.1/>.

1.1.6 LEANER SECTION

1.1.6.1 Content

1.1.6.2 Solve the following puzzle

B	C	E	H	I	M	N	O	P	R	T	U
17	11	5	14	21	7	2	6	8	4	18	12

Table 1.1

1.1.6.3 Clues:

1. 24 ÷ 12	8. 36 ÷ 6
2. 5 + 7	9. 14 ÷ 7
3. 11 - 4	10. 17 − 6
4. 8 + 9	11. 25 ÷ 5
5. 20 ÷ 4	12. 2 × 4
6. 13 − 9	13. 27 − 9
7. 20 - 9	

Table 1.2

Write your answer here: ____

1.1.6.4 ACTIVITY: To perform mental calculations [LO 1.9.1, LO 1.9.2]

1. In Mathematics it is important to be able to think fast. Let's see how quick you are in your first mental arithmetic test in Grade 6. Work as quickly and as accurately as possible.

1.1.6.5 1. Think fast!

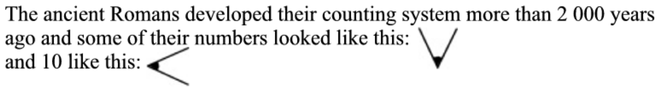
In Mathematics it is important to be able to think fast. Let's see how quick you are in your first mental arithmetic test in Grade 6. Work as quickly and as accurately as possible.

1.1 56 + ... = 83	1.4 .... `[U+F0B8]` 9 = 7
1.2 49 × 15 = ...	1.5 Halve 85: ....
1.3 12 × 8 = ...	1.6 Double 163: ....
1.7 20 × .... = 2 000	1.12 A half × .... = 150
1.8 (7 × 9) − 8	1.13.. (38 + 49) − 24 = ...
1.9 98 + 99 + 97 = ...	1.14 89 .... 16 = 105
1.10 1 004 − 12 = ...	1.15 998 − .... = 550
1.11 8 × 9 × 6 = 6 × .... × 9	

Table 1.3

Complete: I have ____ correct!!

1.1.6.6 DID YOU KNOW?



The ancient Romans developed their counting system more than 2 000 years ago and some of their numbers looked like this:
and 10 like this:

Figure 1.1

Can you remember what numbering system we make use of today?

____

The ancient Romans developed their counting system more than 2 000 years ago and some of their numbers looked like this: I ; II ; III ; IV ; V

1.1.6.7 2. Let's count

Work with a friend and take turns to count in:

2.1 tens from 19 870 to 20 040
2.2 hundreds from 67 403 backwards to 65 903

- thousands from 37 556 backwards to 29 556
- ten thousands from 25 526 to 95 526

1.1.7 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.9: We know this when the learner performs mental calculations involving:
1.9.1: addition and subtraction;
1.9.2: multiplication of whole numbers to at least 12 x 12.

1.2 To investigate and extend number patterns[2]

1.2.1 MATHEMATICS

1.2.2

1.2.3 Number Concept

1.2.4

1.2.5

1.2.6 EDUCATOR SECTION

1.2.7

1.2.8

1.2.9 Memorandum

1.1 50 800; 50 750; 50 600
1.2 20 600; 20 800; 21 000; 21 200
1.3 63 726; 62 726; 59 726; 58 726
1.4 69 625; 79 625; 89 625; 99 625

1.2.10 Leaner Section

1.2.10.1 Content

1.2.10.1.1 ACTIVITY: To investigate and extend number patterns [LO 2.1.1]

1. When we work with number patterns we either add or subtract to find the next number in the row. See if you can discover the pattern and then fill in the missing numbers:

1.1 50 850 ; _____________ ; ___________ ; 50 700 ; 50 650 ; _______________
1.2 20 200 ; 20 400 ; _____________ ; ____________ ; ___________ ; ___________
1.3 ____________ ; ____________ ; 61 726 ; 60 726 ; ____________ ; ___________
1.4 49 625 ; 59 625 ; ____________ ; ____________ ; ___________ ; ___________

1.2.11 Assessment

Learning Outcome 2: The learner will be able to recognise, describe and represent patterns and relationships, as well as to solve problems using algebraic language and skills.

Assessment Standard 2.1: We know this when the learner investigates and extends numeric and geometric patterns looking for a relationship or rules, including patterns

2.1.1 represented in physical or diagrammatic form.

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[2] This content is available online at <http://cnx.org/content/m19993/1.1/>.

1.3 To use a series of techniques to perform calculations[3]

1.3.1 MATHEMATICS

1.3.2 Number Concept

1.3.3

1.3.4 EDUCATOR SECTION

1.3.5 Memorandum

1.1 50 000 + 400 + 30 + 6
1.2 90 000 + 800 + 10 + 7

1.3.5.1 PUZZLE!

100 000
100 000; hundred thousand

1.3.6 Leaner Section

1.3.6.1 Content

1.3.6.2 ACTIVITY: To use a series of techniques to perform calculations [1.10.3]

1. Do you still remember what "expanded notation" is? Quickly explain it to a partner! Then look at the example and see whether you can write the following numbers in expanded notation:

e.g. 36 518 = 30 000 + 6 000 + 500 + 10 + 8
1.1 50 436 =
1.2 98 017 =

1.3.6.3 PUZZLE!

What number is 10 times larger than 10 000?

Fill in the missing answers:
9 + 1 = 10 ten
99 + 1 = 100 one hundred
999 + 1 = 1 000 one thousand
9 999 + 1 = 10 000 ten thousand
99 999 + 1 = ___________________ ___________________

- Let us see if you were correct!

Hundred thousand	Ten thousand	Thousand	Hundred	Ten	One
HTh	TTh	Th	H	T	U
10 × 10 × 10 × 10 × 10	10 × 10 × 10 × 10	10 × 10 × 10	10 × 10	10	1
3	1	8	5	2	6

Table 1.4

We read 318 526 as three hundred and eighteen thousand five hundred and twenty six.

You were therefore correct if you said 100 000 (hundred thousand).

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[3] This content is available online at <http://cnx.org/content/m19995/1.1/>.

1.3.7 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent patterns and relationships, as well as to solve problems using algebraic language and skills.

Assessment Standard 1.10: We know this when the learner uses a range of techniques to perform written and mental calculations with whole numbers including:

1.10.3: building up and breaking down numbers

1.4 To recognise the place values of digits[4]

1.4.1 MATHEMATICS

1.4.2 Number Concept

1.4.3

1.4.4 EDUCATOR SECTION

1.4.5 Memorandum

	HD	TD	D	H	T	E
1.1		6	0	9	8	0
1.2	5	0	8	1	3	6
1.3	5	0	4	6	0	0
1.4	8	2	6	0	4	0
1.5	4	0	7	0	0	5

Table 1.5

3.1 576 826 = 500 000 + 70 000 + 6 000 + 800 + 20 + 6
3.2 894 392 = 800 000 + 90 000 + 4 000 + 300 + 90 + 2

1.4.6 LEANER SECTION

1.4.6.1 Content

1.4.6.2 ACTIVITY: To recognise the place values of digits [LO 1.4.1]

1.4.6.3 To use a series of techniques to perform calculations [LO 1.10.3]

1. Let's see if you are able to apply your knowledge about hundred thousands. Write the following numbers correctly into the table:

		HT	TT	T	H	T	U
1.1	60 980	___	___	___	___	___	___
1.2	508 136	___	___	___	___	___	___
1.3	Five hundred and four thousand six hundred	___	___	___	___	___	___
1.4	Eight hundred and twenty six thousand and forty	___	___	___	___	___	___
1.5	Four hundred and seven thousand and five	___	___	___	___	___	___

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[4] This content is available online at <http://cnx.org/content/m19997/1.1/>.

Table 1.6

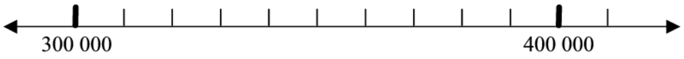

Figure 1.2

2. If you are able to "read" a number line correctly, you will be able to determine exactly where any number fits in. Work with a partner and use arrows to indicate the approximate positions of the following numbers in the number line.

2.1 318 500
2.2 347 899
2.3 372 000
2.4 398 799
2.5 403 000

3. In Activity 1.3 you have had the opportunity to write numbers in expanded notation.

See if you can also do it correctly with the following numbers:

e.g. 26 113 = 20 000 + 6 000 + 100 + 10 + 3
3.1 576 826 =
3.2 894 392 =

1.4.6.3.1 DO YOU STILL REMEMBER?

= means it is equal to
^{1} means it is not equal to
< means it is smaller than
Ø means it is bigger than

1.4.7 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent patterns and relationships, as well as to solve problems using algebraic language and skills.

Assessment Standard 1.4: We know this when the learner recognises the place value of digits in:

1.4.1 whole numbers to at least 9-digit numbers

Learning Outcome 1: The learner will be able to recognise, describe and represent patterns and relationships, as well as to solve problems using algebraic language and skills.

Assessment Standard 1.10: We know this when the learner uses a range of techniques to perform written and mental calculations with whole numbers including:

1.10.3: building up and breaking down numbers

1.5 To recognise and compare numbers[5]

1.5.1 MATHEMATICS

1.5.2 Number Concept

1.5.3

1.5.4 EDUCATOR SECTION

1.5.5 Memorandum

1.1 >
1.2 <
1.3 =
1.4 >
1.5 =

1.5.6 LEANER SECTION

1.5.6.1 Content

1.5.6.2 ACTIVITY: To recognise and compare numbers [LO 1.3.1]

1. Look carefully at the following numbers and say each one out loud. Then see whether you are able to fill in the correct relationship signs (<; > or =) by comparing them:

1.1 216 847 * 126 847
1.2 489 607 * 489 670
1.3 10 000 × 10 * 200 000 ÷ 2
1.4 10 × 10 × 10 × 10 * 100 000 ÷ 100
1.5 1 000 × 100 * 100 × 10 × 100

1.5.7 Assessment

Learning Outcome 1:The learner will be able to recognise, describe and represent patterns and relationships, as well as to solve problems using algebraic language and skills.

Assessment Standard 1.3: We know this when the learner recognises and represents the following numbers in order to describe and compare them:

1.3.1: whole numbers to at least 9-digit numbers.

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[5] This content is available online at <http://cnx.org/content/m19999/1.1/>.

1.6 To calculate by selecting and using operations appropriate to solving problems[6]

1.6.1 MATHEMATICS

1.6.2 Number Concept

1.6.3

1.6.4 EDUCATOR SECTION

1.6.5 Memorandum

1.1 1 065
1.2 2 466
1.3 28 745
1.4 50 271
1.5 373 097
1.6 462 563

1.6.5.1 PUZZLE!

12 54 24
42 30 18
36 6 48

1.6.6 LEANER SECTION

1.6.6.1 Content

1.6.6.2 ACTIVITY: To calculate by selecting and using operations appropriate to solving problems [LO 1.8.2]

1.6.6.3 To use a series of techniques to perform calculations [LO 1.10.1]

1. Read the following questions attentively. Then decide which operations you need to use to find the answers. Use your pocket calculator and write down the number that is:
   1.1 598 more than 467
   1.2 2 346 less than 4 812
   1.3 5 098 more than 23 647
   1.4 46 138 less than 96 409
   1.5 123 516 more than 249 581
   1.6 435 091 less than 897 654

1.6.6.4 PUZZLE!

- Complete the following magic square. The sum of the numbers down, across or diagonally is 90.

12	_______	_______
_______	30	18
_______	_______	_______

---

[6] This content is available online at <http://cnx.org/content/m20003/1.1/>.

Table 1.7

1.6.6.5 TIME FOR SELF-ASSESSMENT

	I can count forwards and backwards in hundreds. (LO 1.9)	1	2	3	4	
	I can count forwards and backwards in thousands. (LO 1.9)	1	2	3	4	
	I can count forwards and backwards in ten thousands. (LO 1.9)	1	2	3	4	
	I can complete number sequences by observing the patterns. (LO 2.1)	1	2	3	4	
	I can write numbers by means of expanded notation. (LO 1.10)	1	2	3	4	
	I am able to read hundred thousands from a number line. (LO 1.4 en LU 1.10)	1	2	3	4	
	I can fill in the relationship signs (< ; > ; =) correctly. (LO 1.3)	1	2	3	4	

Table 1.8

1.6.7 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.8: We know this when the learner estimates and calculates by selecting and using operations appropriate to solving problems that involve:

1.8.2: addition and subtraction of whole numbers.

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.10:We know this when the learner uses a range of techniques to perform written and mental calculations with whole numbers including:

1.10.1: adding, subtracting and multiplying in columns.

1.7 To perform mental calculations[7]

1.7.1 MATHEMATICS

1.7.2 Number Concept

1.7.3

1.7.4 EDUCATOR SECTION

1.7.5 Memorandum

- 203; 190; 173; 208; 236; 222; 253; 471; 570; 459; 423; 472; 430; 343; 453; 357; 315

1 000 000

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[7] This content is available online at <http://cnx.org/content/m20005/1.1/>.

1.7.6 LEANER SECTION

1.7.6.1 Content

1.7.6.2 ACTIVITY: To perform mental calculations [LO 1.8.2]

1.7.6.3 COMPETITION TIME!

- Compete with a friend to see who can complete this arrow diagram CORRECTLY first! You may not use a pocket calculator.

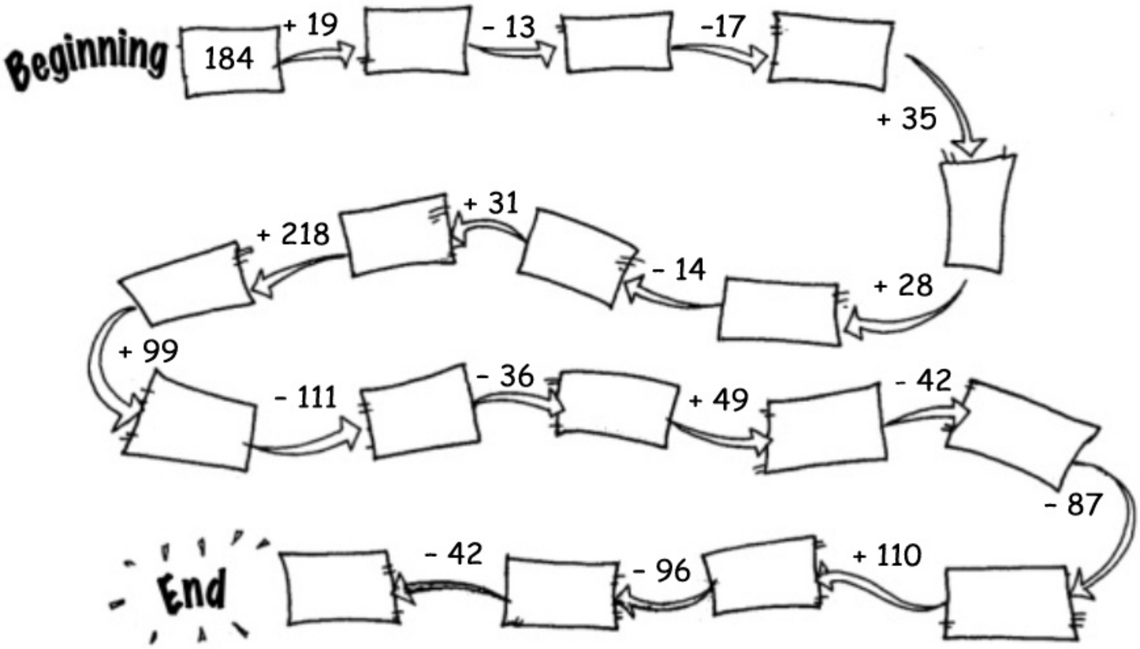


Figure 1.3

1.7.6.3.1 THE REMARKABLE MILLION!

You already know the following:

10 x 10 = 100
100 x 10 = 1 000
1 000 x 10 = 10 000
10 000 x 10 = 100 000
Look carefully at the above pattern and fill in:
100 000 x 10 = ____
Correct! 100 000 x 10 = 1 000 000
We read: 1 000 000 is one million

- In the notation column it looks like this:

Million	Hundred thousand	Ten thousand	Thousand	Hundred	Ten	One
M	HTh	TTh	Th	H	T	U
1 000 000	100 000	10 000	1 000	100	10	1

Table 1.9

- Let's read these big numbers:

4 721 568 is read as 4 million 721 thousand 568

Thus: Four million seven hundred and twenty one thousand five hundred and sixty eight

1.7.6.3.2 NOTE!

We group figures (digits) in threes from the right.

In the example the first space from the left tells us how many millions we have. The second space from the left indicates how many thousands there are.

E.g. 3 (million) 268 (thousand) 413

1.7.7 Assessment

Learning Outcome 1:The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.9: We know this when the learner performs mental calculations involving:

1.9.1: addition and subtraction.

1.8 To recognise and describe numbers[8]

1.8.1 MATHEMATICS

1.8.2 Number Concept

1.8.3

1.8.4 EDUCATOR SECTION

Memorandum

1.1 four million one hundred and thirty six thousand two hundred and eighty four
1.2 eight million two hundred forty seven thousand and nine
1.3 three million six thousand five hundred
2.1 5 400 816
2.2 2 620 018
2.3 12 700 006

---

[8] This content is available online at <http://cnx.org/content/m20007/1.1/>.

1.8.5 LEANER SECTION

1.8.5.1 Content

1.8.5.2 ACTIVITY: To recognise and describe numbers [LO 1.3.1]

1. On page 6 we saw how large numbers (hundred thousands) have to be read and how we write them as words. The above example shows how we read and write millions. Take another careful look at it and then write the following numbers in words:

1.1 4 136 284 ____

____

1.2 8 247 009 ____

____

1.3 3 006 500____

____

2. Here the numbers have been written out in words. See if you can write them in figures:

2.1 Five million four hundred thousand eight hundred and sixteen

____

2.2 Two million six hundred and twenty thousand and eighteen

____

2.3 Twelve million seven hundred thousand and six

____

1.8.6 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.3: We know this when the learner recognises and represents the following numbers in order to describe and compare them:

1.3.1: whole numbers to at least 9-digit numbers.

1.9 To recognise the place values of digits[9]

1.9.1 MATHEMATICS

1.9.2 Number Concept

1.9.3

1.9.4 EDUCATOR SECTION

1.9.5 Memorandum

1.1 200 000
1.2 5 000 000
1.3 80 000
1.4 20 000 000

---

[9] This content is available online at <http://cnx.org/content/m20009/1.1/>.

1.9.6 LEANER SECTION

1.9.6.1 Content

1.9.6.2 ACTIVITY: To recognise the place values of digits [LO. 1.4.1]

1. If we know what the place value of a digit is, it is child's play to determine the value of that digit. Look at the following numbers. Write down the values of the digits in bold print:

e.g. : 456 **98**1 80
1.1 3 **2**16 417
1.2 **5** 641 218
1.3 4 **18**6 046
1.4 **2**3 521 000

1.9.6.2.1 DID YOU KNOW?

If you started to count in seconds, it would take you almost 12 days to count to a million!

1.9.7 Assessment

Learning Outcome 1:The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.4: We know this when the learner recognises the place value of digits in:

1.4.1: whole numbers to at least 9-digit numbers

1.10 To use a series of techniques to perform calculations[10]

1.10.1 MATHEMATICS

1.10.2 Number Concept

1.10.3

1.10.4 EDUCATOR SECTION

1.10.5 Memorandum

1.1 16 667
694
2
2. No. Would have been 2 739 years old

1.10.6 LEANER SECTION

1.10.6.1 Content

1.10.6.2 Activity: To use a series of techniques to perform calculations [LO 1.10.5]

1. Use your pocket calculator and write down the answers to the nearest counting number (e.g. 26,893 = 27)

1.1
1 million minutes = ____hours
= ____days
= ____year

---

[10] This content is available online at <http://cnx.org/content/m20010/1.1/>.

2. Have you already been on the earth for a million days?
Explain your answer to a friend.

1.10.7 Assessment

Learning Outcome 1:The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.10: We know this when the learner uses a range of techniques to perform written and mental calculations with whole numbers including:

1.10.5: using a calculator.

1.11 To recognise numbers in order to compare them[11]

1.11.1 MATHEMATICS

1.11.2 Number Concept

1.11.3

1.11.4 EDUCATOR SECTION

1.11.5 Memorandum

1. Appelfontein
2. Radysland
3. Lemoenburg
4. Kersieville
5. Perskestad

1.11.6 LEANER SECTION

1.11.6.1 Content

1.11.6.2 ACTIVITY: To recognise numbers in order to compare them [LO 1.3.1]

1. First read the following numbers out loud to a partner. Then arrange the towns from LARGE to small according to their populations.

TOWN	POPULATION	
Cherryville	7 146 086	1. ____________________________
Appleton	11 086 413	2. ____________________________
Sunland	11 006 412	3. ____________________________
Peachville	3 159 886	4. ____________________________
Orangeburg	7 146 213	5. ____________________________

Table 1.10

1.11.6.3 DID YOU KNOW?

1 000 million is a MILLIARD or BILLION!

---

[11] This content is available online at <http://cnx.org/content/m20011/1.1/>.

1.11.6.4 DID YOU ALSO KNOW?

We can write 10 as 101.

We say 10 to the power of 1
This means:
10 x 1 = 10
102 = 10 to the power of 2
= 10 x 10 = 100
103 = 10 to the power of 3
= 10 x 10 x 10 = 1 000
104 = 10 to the power of 4
= 10 x 10 x 10 x 10 = 10 000

1.11.7 Assessment

Learning Outcome 1:The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.3: We know this when the learner recognises and represents the following numbers in order to describe and compare them:

1.3.1: whole numbers to at least 9-digit numbers.

1.12 To use a series of techniques to perform calculations[12]

1.12.1 MATHEMATICS

1.12.2 Number Concept

1.12.3

1.12.4 EDUCATOR SECTION

1.12.5 Memorandum

1. 10 x 10 x 10 x 10 x 10
100 000
10 x 10 x 10 x 10 x 10 x 10
1 000 000
2.1 2 x 2 x 2 = 8
2.2 3 x 3 x 3 x 3 = 81
2.3 5 x 5 x 5 = 125
2.4 1 000 ÷ 100 = 10
2.5 10 x 10 x 10 x 10 x 10 = 100 000
2.6 6
2.7 9

1.12.6 LEANER SECTION

1.12.6.1 Content

1.12.6.2 ACTIVITY: To use a series of techniques to perform calculations [LO 1.10.3]

1. Study the examples above and then complete the following:

---

[12] This content is available online at <http://cnx.org/content/m20013/1.1/>.

10^5 = ____
=
10^6 = ____
=
2. Can you also write down the answers to the following?
e.g. 52 = 5 x 5 = 25
2.1 23 =
2.2 34 =
2.3 53 =
2.4 103 ¸ 102 =
2.5 10 x 104 =
2.6 one million = 10¨
2.7 one billion = 10¨

1.12.7 Assessment

Learning Outcome 1:The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.10: We know this when the learner recognises and represents the following numbers in order to describe and compare them:

1.10.3: whole numbers to at least 9-digit numbers.

1.13 To calculate by selecting appropriate operations for solving problems[13]

1.13.1 MATHEMATICS

1.13.2 Number Concept

1.13.3

1.13.4 EDUCATOR SECTION

1.13.5 Memorandum

1. Look at the tenth didgit. If 5 or more, add one to hundreth number. If 4 or less the hundreth number stays the same. Replace tenth and one-numbers with nought.

2. hundreds
thousands add one
hundreds, tens and ones
3.1 8 000 8 000
3.2 47 200 47 000
3.3 150 500 151 000
3.4 3 409 200 3 409 000
3.5 5 631 000 5 631 000

1.13.5.1 Brain Teaser

i) R90 000
ii) R14 000

---

[13] This content is available online at <http://cnx.org/content/m20018/1.1/>.

1.13.6 LEANER SECTION

1.13.6.1 Content

1.13.6.2 ACTIVITY: To calculate by selecting appropriate operations for solving problems[LO 1.8.1]

1. In Grade 5 we saw repeatedly how important it was to round off correctly. Amongst other things, it can help us to estimate an answer quickly, without using pencil and paper.

1.13.6.2.1 ROUNDING OFF

- Let's revise
- Explain to your friend how we round off to the nearest 100.

2. Try to complete the following on your own:

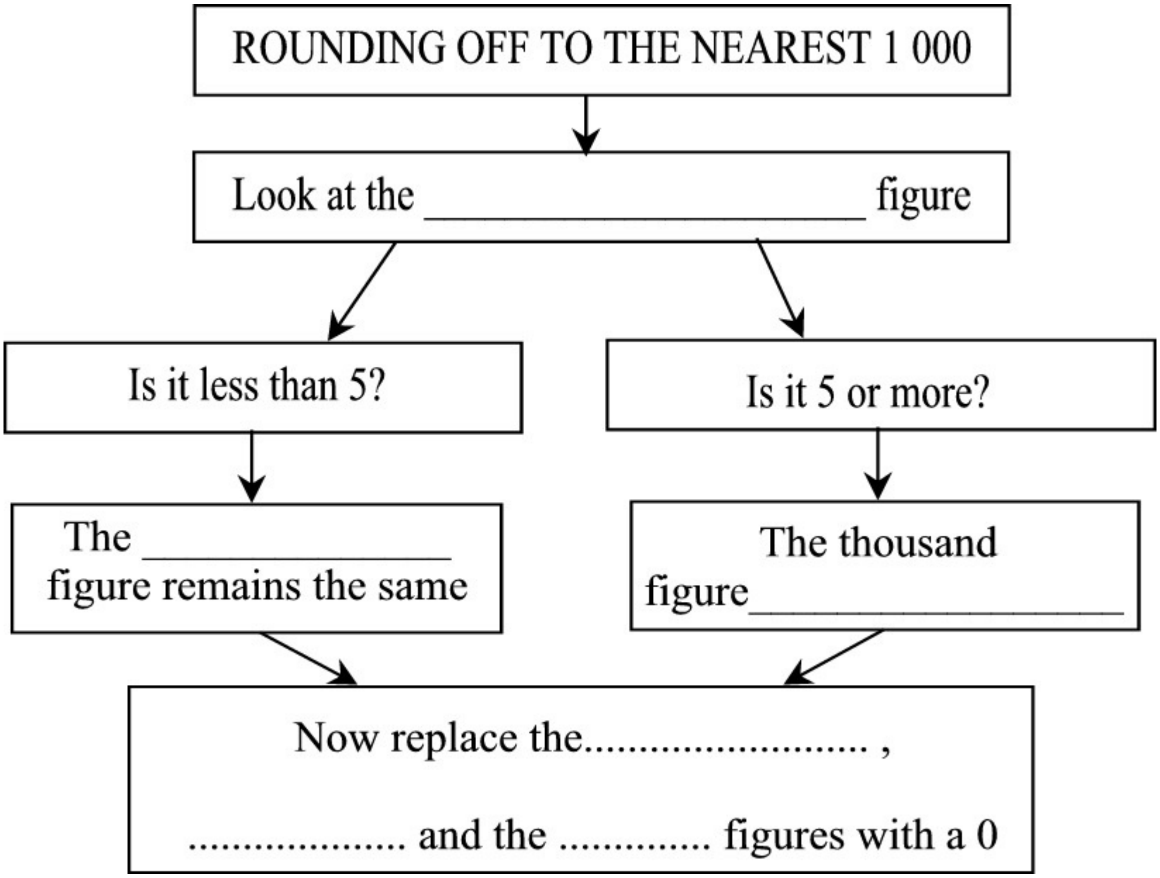

ROUNDING OFF TO THE NEAREST 1 000
Look at the ____________________ figure
Is it less than 5?
Is it 5 or more?
The ______________ figure remains the same
The thousand figure_________________
Now replace the......................... ,
.... and the .... figures with a 0

Figure 1.4

If you are unable to do it on your own, ask a friend to help you!

3. Complete the following table:

	number	rounded off to the nearest 100	rounded off to the nearest 1 000
3.1	7 995		
3.2	47 216		
3.3	150 505		
3.4	3 409 235		
3.5	5 630 981		

Table 1.11

1.13.6.3 PUZZLE!

- Can you round off the following to the nearest 10 000?

i) ____

Price **R89 895**

ii) ____

Price **R13 995**

TIME FOR SELF-ASSESSMENT

How well do you understand the preceding work? Assess yourself on a scale of 1 to 4. Circle the appropriate code:

1 = needs attention
2 = fairly good
3 = very good
4 = excellent

Criteria:	Code			
I can read 7-digit numbers correctly. (LO 1.3)	1	2	3	4
I can write 7-digit numbers correctly in words. (LO 1.3)	1	2	3	4
I am able to determine the value of digits in a number correctly. (LO 1.4)	1	2	3	4
I understand the powers of 10 and can use them correctly. (LO 1.10)	1	2	3	4
I can round off correctly to the nearest 100. (LO 1.8)	1	2	3	4
I can round off correctly to the nearest 1 000. (LO 1.8)	1	2	3	4
I can round off correctly to the nearest 10 000. (LO 1.8)	1	2	3	4

Table 1.12

1.13.7 Assessment

Learning Outcome 1:The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.8: We know this when the learner estimates and calculates by selecting and using operations appropriate to solving problems that involve:

1.8.1: rounding off to the nearest 5, 10, 100 or 1 000.

1.14 To perform mental calculations[14]

1.14.1 MATHEMATICS

1.14.2 Number Concept

1.14.3 EDUCATOR SECTION

1.14.4

1.14.5 Memorandum

1.1 8
1.2 12
1.3 775
1.4 2 700
1.5 * +7
1.6 11
1.7 9 rem 3
1.8 9 000
1.9 6 248
1.10 504
1.11 350
1.12 200
1.13 45
1.14 8
1.15 6 rem 5

1.14.6 LEANER SECTION

1.14.6.1 Content

1.14.6.2 ACTIVITY: To perform mental calculations [LO 1.9.1, LO 1.9.2]

1. It is time to see whether you are able to improve your skill in mental calculation. Without using a pocket calculator, work as quickly and accurately as possible:
1.1 _________ x 9 = 72 1.9
1.2 _________ x 8 = 96
1.3 5 000 − 4 225 = _________
1.4 2 575 + 125 = _________
1.5 (7 x _________ + 7 = 70
1.6 (5 x 9) − _________ = 34
1.7 84 ¸ 9 = _________

- Round off to the nearest 1 000: 9 450: _________
- Double: 3 124: _________

1.10 Halve 1 008: _________
1.11 250 + 25 + 75 = _________
1.12 (9 x 12) + 92 = _________
1.13 (12 x 12) − _________ = 99
1.14 (42 + _________) x 100 = 5 000
1.15 53 ¸ 8 = _________

---

[14] This content is available online at <http://cnx.org/content/m20019/1.1/>.

I got ____ out of the 15 correct!
Colour the appropriate space: I have:

IMPROVED	WEAKENED	THE SAME MARK AS WITH MY FIRST TEST

Table 1.13

1.14.7 Assessment

Learning Outcome 1:The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.9: We know this when the learner performs mental calculations involving:
1.9.1: addition and subtraction;
1.9.2: multiplication of whole numbers to at least 12 x 12.

1.15 To recognise and represent numbers in order to describe and compare them[15]

1.15.1 MATHEMATICS

1.15.2 Number Concept

1.15.3

1.15.4 EDUCATOR SECTION

1.15.5 Memorandum

2.1 Prime numbers: 11; 13; 17; 19
2.2 Even numbers: 8; 10; 12; 14
2.3 Multiples of 6: : 6; 12; 18; 24; 30; 36
2.4 Counting numbers 0; 1; 2; 3; 4; 5; 6
2.5 Factors of 24: 1; 2; 3; 4; 6; 8; 12; 24
3.1 * 44
3.2 12
3.3 10
3.4 5

1.15.6 LEANER SECTION

1.15.6.1 Content

1.15.6.2 Activity: To recognise and represent numbers in order to describe and compare them [LO 1.3.6, LO 1.3.7]

1. At the beginning of Grade 5 (Module 1) we looked thoroughly at multiples, factors and prime numbers. Do you remember what each of these is? Let us revise!

Explain the difference between a multiple, a factor and a prime number to a friend:

---

[15] This content is available online at <http://cnx.org/content/m20022/1.1/>.

1.15.6.2.1 NOTE!

Multiples of 5 = 5 ; 10 ; 15 ; 20 ; etc.
We count in fives
Factors can be divided exactly into a number.
The factors of 12 = 1 ; 2 ; 3 ; 4 ; 6 ; 12
A prime number has only two different factors,
e.g. The factors of 2: 2 and 1
The factors of 3: 3 and 1
The factors of 5: 5 and 1

1.15.6.2.2 DO YOU REMEMBER?

You can use the constant function of your pocket calculator to calculate the multiples of a number. E.g. for the multiples of 4, key in:

4 + + = = = = = =

- Use your pocket calculator to determine the multiples of 13, 15 and 24.

2. Draw lines to show which descriptions in column A match with numbers in column B:

	Column A	Column B
2.1	Prime numbers	8 ; 10 ; 12 ; 14
2.2	Even numbers	1 ; 2 ; 3 ; 4 ; 6 ; 8 ; 12 ; 24
2.3	Multiples of 6	0 ; 1 ; 2 ; 3 ; 4 ; 5 ; 6
2.4	Counting numbers	11 ; 13 ; 17 ; 19
2.5	Factors of 24	6 ; 12 ; 18 ; 24 ; 30 ; 36

Table 1.14

3. Work with a friend to solve the following puzzle:

1.15.6.2.3 WHAT NUMBER AM I?

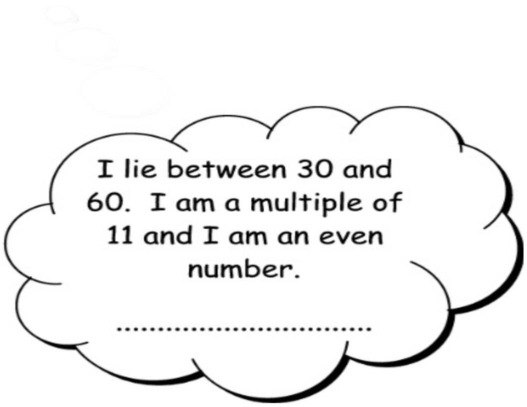

I lie between 30 and 60. I am a multiple of 11 and I am an even number.
....

Figure 1.5

3.1

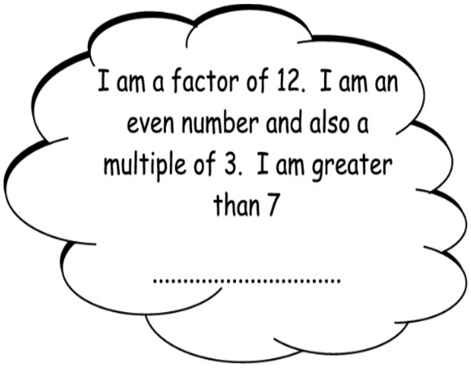

I am a factor of 12. I am an even number and also a multiple of 3. I am greater than 7
....

Figure 1.6

3.2

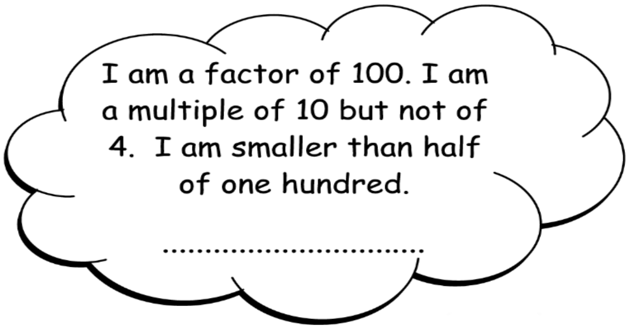

I am a factor of 100. I am a multiple of 10 but not of 4. I am smaller than half of one hundred.
....

Figure 1.7

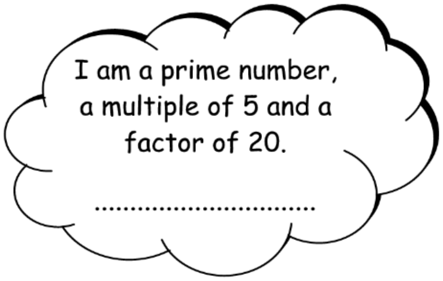

I am a prime number, a multiple of 5 and a factor of 20.
....

Figure 1.8

3.3
3.4

1.15.7 Assessment

Learning Outcome 1:The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.3: We know this when the learner recognises and represents the following numbers in order to describe and compare them:

1.3.6: multiples and factors of at least any 2-digit and 3-digit whole number;

1.3.7: prime numbers to at least 100.

1.16 To recognise and represent numbers in order to describe and compare them[16]

1.16.1 MATHEMATICS

1.16.2 Number Concept

1.16.3

1.16.4 EDUCATOR SECTION

1.16.5 Memorandum

- no
- yes
- yes

1.4 yes

1.16.6 LEANER SECTION

1.16.6.1 Content

1.16.6.2 ACTIVITY: To recognise and represent numbers in order to describe and compare them [LO 1.3.1]

1.16.6.3 PALINDROME:

1.16.6.3.1 Did you know?

A palindrome is a number which can be read forwards and backwards, e.g. 343 en 1 221

1. Are the following numbers palindromes?

1.1 123 123 ____

1.2 46 064____

1.3 1 328 231____

1.4 43 499 434____

1.16.7 Assessment

Learning Outcome 1:The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.3: We know this when the learner recognises and represents the following numbers in order to describe and compare them:

1.3.1: whole numbers to at least 9-digit numbers.

---

[16] This content is available online at <http://cnx.org/content/m20042/1.1/>.

1.17 (Untitled)To recognise and represent numbers in order to describe and compare them[17]

1.17.1 MATHEMATICS

1.17.2 Number Concept

1.17.3

1.17.4 EDUCATOR SECTION

1.17.5 Memorandum

1. Answers of learners may differ
   2. Plus and minus
   3. Answers of learners may differ
   4. Multiply and divide
   5.1 0
   5.2 0
   5.3 34
   5.4 k
   5.5 c
   5.6 does not change

1.17.6 LEANER SECTION

1.17.6.1 Content

1.17.6.2 ACTIVITY: To recognise and represent numbers in order to describe and compare them [LO 1.3.4]

1.17.6.3 To determine output values for given input values [LO 2.3.2]

1. Do you remember the following? In Grade 5 (Module 2) we looked at the rules for multiplying and dividing by 0 and 1. Let us look at the properties of 0 and 1:

Fill in any number on the left and complete the flow diagram.

---

[17] This content is available online at <http://cnx.org/content/m20043/1.1/>.

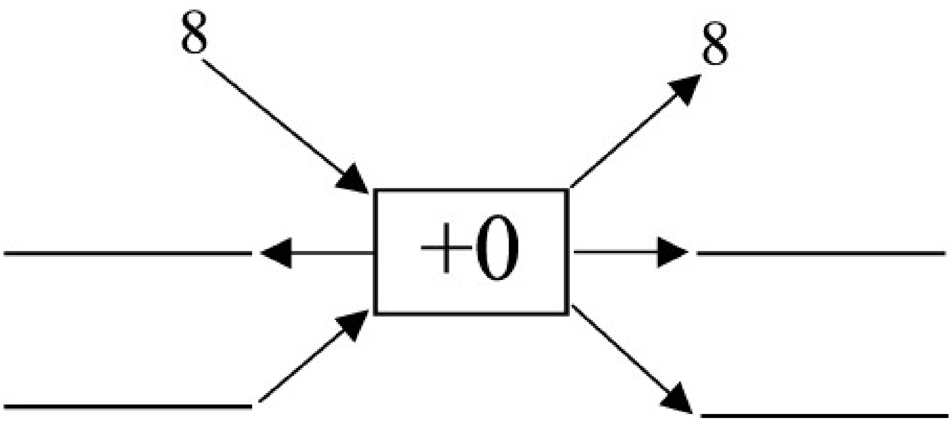


Figure 1.9

1.1

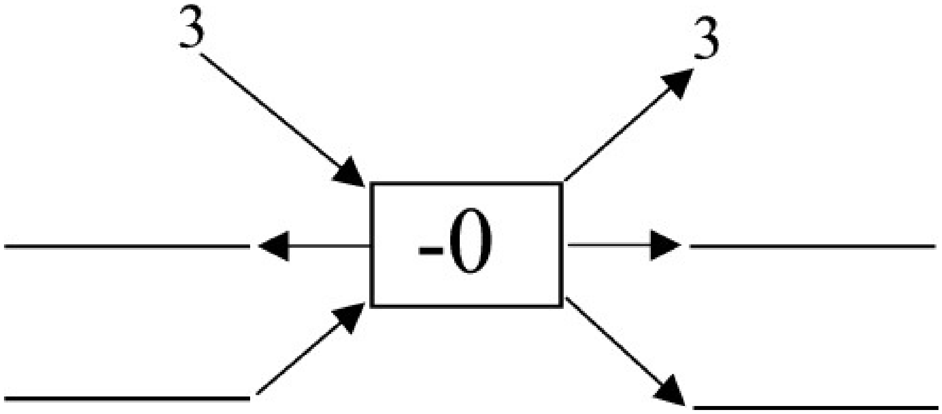


Figure 1.10

1.2
1.3

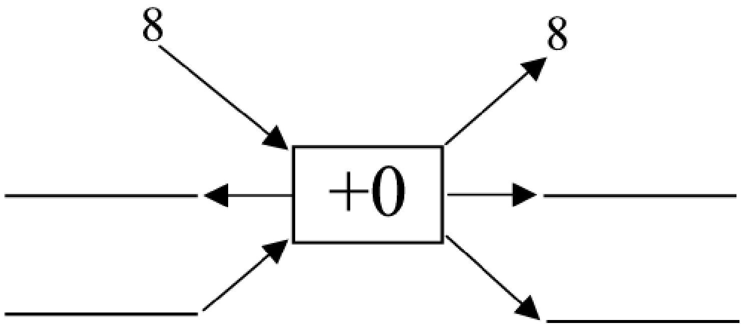


Figure 1.11

---

2. Tell a friend which calculations with 0 do NOT change the value of a number.

1.17.6.3.1 NOTE!

Dividing with 0 is not allowed. We say that dividing by 0 is undefined.

3. Once again, fill in numbers on the left and complete the flow diagrams:

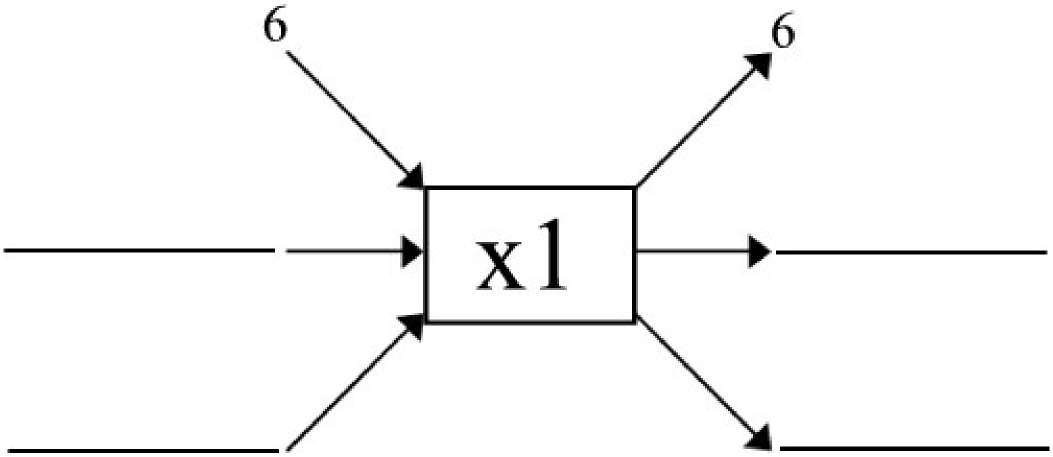


Figure 1.12

3.1

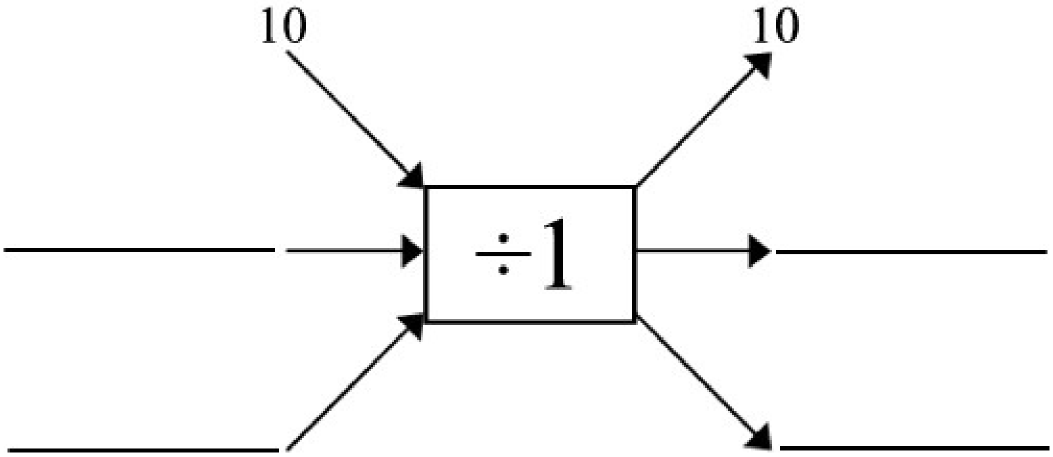


Figure 1.13

3.2

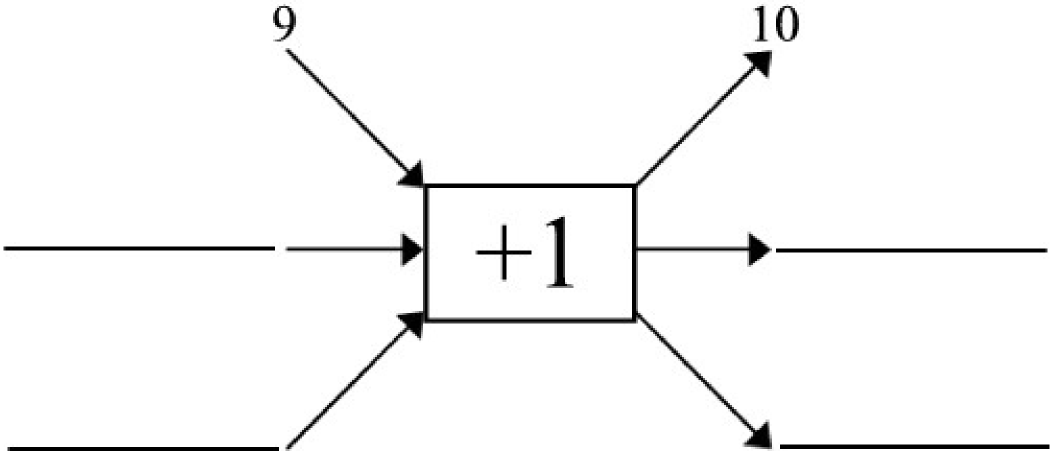


Figure 1.14

3.3

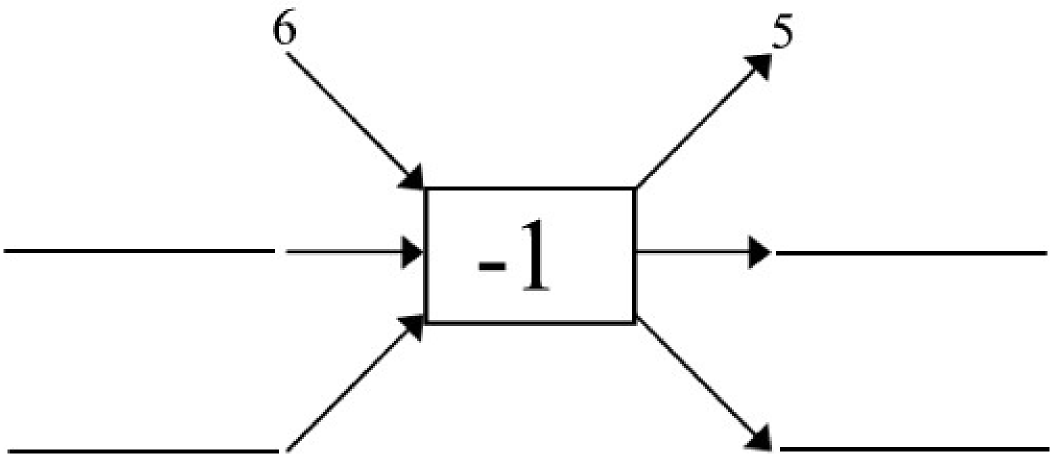


Figure 1.15

3.4
4. Tell a friend which calculations with 1 do NOT change the value of a number.
5. Now calculate:
5.1 148 x 0 x 236 =
5.2 0 ¸ 36 =
5.3 34 ¸ 1 x 1 =
5.4 k + 0 =
5.5 c ¸ 0 =

- 58 ¸ 0 =

1.17.7 Assessment

Learning Outcome 1:The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.3: We know this when the learner recognises and represents the following numbers in order to describe and compare them:

1.3.4: 0 in terms of its additive property.

1.18 To calculate by selecting appropriate operations for solving problems[18]

1.18.1 MATHEMATICS

1.18.2 Number Concept

1.18.3

1.18.4 EDUCATOR SECTION

1.18.5 Memorandum

1.1 5
1.2 3
1.3 8
1.4 6
2.1 (39 x 27) + 496 1 549
2.2 (23 x 18) + 852 – 256 1 010
2.3 (67 + 48); 7 705 ÷ answer 67
2.4 3 600 ÷ 30; 82 x 10; answer + answer 940
2.5 2 934 – 816 + 905 – 205 2 818

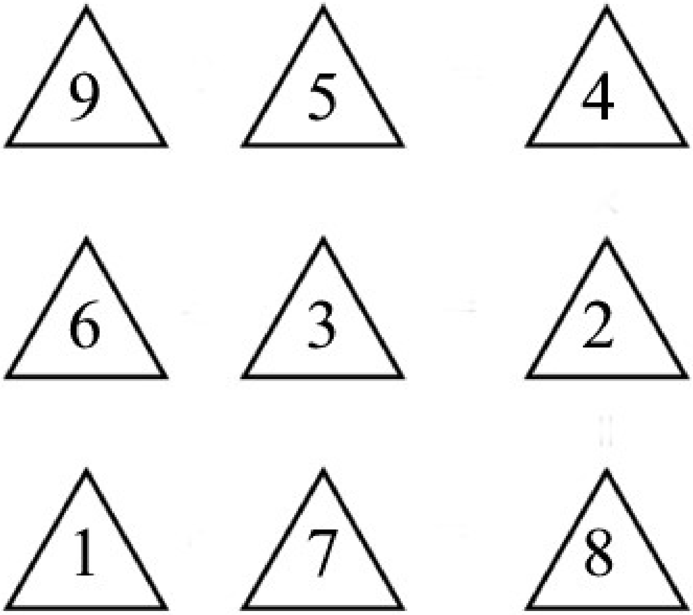


Figure 1.16

---

[18] This content is available online at <http://cnx.org/content/m20044/1.1/>.

1.18.6 2. Different solutions are possible. You are aloud to use a number more than once.

Test 1

- 13 800; 13 750
- 24 360; 24 375

2. 300 000 + 60 000 + 8 000 + 400 + 20 + 9

- <
- =

- 20 500
- 358 490

5. six million eight hundred twenty three thousand four hundred and seventeen
6.1 1296
6.2 6

- 40 000
- 6 million

- 37 000
- 149 000

- 48; 56; 64; 72
- 1; 2; 3; 4; 5; 6; 8; 12; 24
- 11; 13; 17; 19

10.1 true

- false
- false

- 114
- 34
- 70

11.4 6

1.18.7 LEANER SECTION

1.18.7.1 Content

1.18.7.2 ACTIVITY:To calculate by selecting appropriate operations for solving problems [LO 1.8.10]

It is very important to really understand and remember the following; otherwise you will not be able to perform easy (or difficult) operations, so that you will get wrong answers!

SEQUENCE OF CALCULATIONS TAKE NOTE AND LEARN THE
FOLLOWING!
The order in which calculations are done is:

1. Brackets
2. Of
3. Division
4. Multiplication
5. Addition
6. Subtraction

The following rules are also applicable:

1. When the operation is + only or x only, e.g. 6 + 3 + 9 + 5:
work from LEFT TO RIGHT.
2. When there is only + and − , e.g. 6 − 3 + 2 − 4 + 9:
work from LEFT TO RIGHT
Thus: 6 − 3 à 3 + 2 à 5 − 4 à 1 + 9 = 10
3. When you only have x and ¸ is, e.g. 2 x 24 ¸ 4 x 10 ¸ 5:
Work from LEFT TO RIGHT
Thus: 2 x 24 à 48 ¸ 4 à 12 x 10 à 120 ¸ 5 = 24

1. Let's see if you are able to apply the preceding knowledge correctly. Work with a partner and calculate the following:

1.1 f = 9 + 6 ¸ 2 − 7 ____

1.2 c = 7 − (18 + 2) ¸ 5____

1.3 k = 23 − 16 + 4 − 3____

1.4 e = 36 ¸ 12 x 4 ¸ 2____

You may use your pocket calculator now, but it might not help if you do not know the correct sequence of operations. If you are uncertain, read the previous page again. Try to complete the following table correctly:

	Calculate	Key to sequence	Answer
E.g.	15 + 6 × 2	(6 × 2) + 15	27
2.1	496 + 39 × 27		
2.2	852 + (23 × 18) − 256		
2.3	7 705 [U+F0B8] (67 + 48)		
2.4	3 600 [U+F0B8] 30 + 82 × 10		
2.5	2 934 − 816 + 905 − 205		

Table 1.15

1.18.7.2.1 TIME FOR PEER-ASSESSMENT

How well do you know the last part of the work that we have been doing? Explain the following to a partner. Your partner can then assess you by circling the relevant code:

	Altogether unsure	Not very sure	Fairly sure	Very sure

continued on next page

I can explain what multiples are. (LO 1.3)	1	2	3	4
I can explain what factors are. (LO 1.3)	1	2	3	4
I can explain what prime numbers are. (LO 1.3)	1	2	3	4
I can use the constant function on my pocket calculator to determine multiples. (LO 1.8)	1	2	3	4
I can explain what a palindrome is. (LO 1.3)	1	2	3	4
I can explain the properties of 1 and 0 to my friend. (LO 1.3)	1	2	3	4
I know the sequence of calculations and can apply it correctly. (LO 1.8)	1	2	3	4

Table 1.16

1.18.7.2.2 PUZZLES!

1. Place the numbers 1 to 9 in the diagram in such a way that all the number sentences are true.

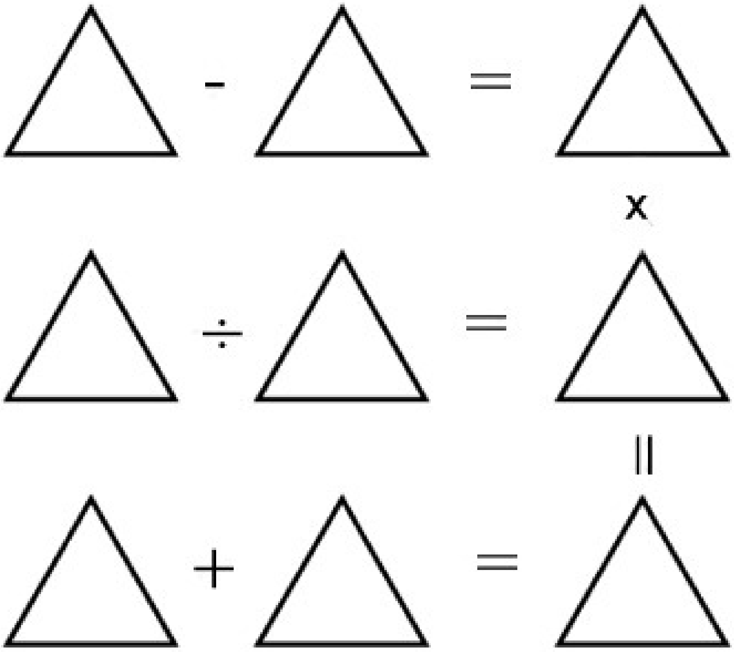


Figure 1.17

2. Place numbers between 1 and 12 in the diagram in such a way that the sum totals of the different sides are the same.

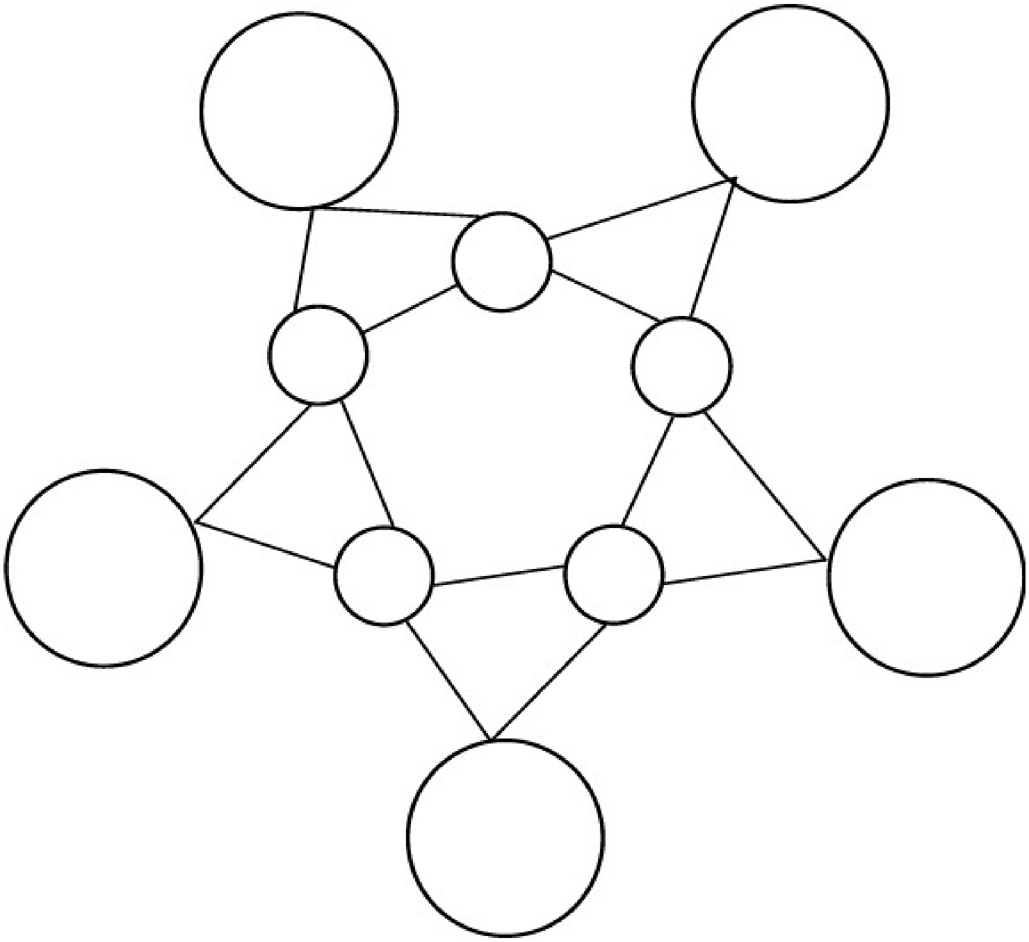


Figure 1.18

1.18.7.2.3 TEST 1

1. Complete the following number patterns:

1.1 13 850 ; ___________________ ; ___________________ ; 13 700 ; 13 650

1.2 24 330 ; 24 345 ; ___________________ ; ___________________

(4)

2. Write in expanded notation:

2.1 368 429 = ______________ + ______________ + _____________ + _____________ + ______________ + ______________

(2)

3. Fill in: < ; > or = :

3.1 489 653 * 498 653______________

3.2 10 x 10 x 10 x 10 * 100 000 x 10______________

(2)
4. Which number is:
4.1 350 more than 20 150? __________________________
4.2 10 000 less than 368 490? ________________________
(2)
5. Write in words:
6 832 419
(2)
6. Complete:
6.1 64 = ____
6.2 one million = 1 x 10¨________________________
(2)
7. What is the value of the digit printed in bold?
7.1 1**4**7 689____
7.2 **6** 823 417____
(2)
8. Round off to the nearest 1 000:
8.1 36 842____
8.2 149 099____
(2)
9. Write down:
9.1 the multiple of 8 between 40 and 80
____
9.2 the factors of 24
____
9.3 the prime numbers between 10 and 20
____
(6)
10. True or False?
10.1 42 624 is a palindrome________________________________
10.2 1 is a prime number___________________________________
10.3 36 ¸ 0 = 0____
(3)
11. Calculate:
11.1 90 + 6 x 12 ¸ 3____________________________________
11.2 36 − (5 x 4) ¸ 10__________________________________
11.3 80 − 6 + 4 − 13 + 5_______________________________
11.4 8 x 5 ¸ 8 x 6 ¸ 5_________________________________
(8)
I got __________________________________ out of 35 right.
Colour in: I feel

VERY SATISFIED
HAPPY
CONCERNED
I AM ABLE TO DO BETTER

Table 1.17

1.18.8 Assessment

Learning Outcome 1:The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.8: We know this when the learner estimates and calculates by selecting and using operations appropriate to solving problems that involve:

1.8.10: multiple operations on whole numbers with or without brackets.

1.19 To perform mental calculations[19]

1.19.1 MATHEMATICS

1.19.2 Number Concept

1.19.3 EDUCATOR SECTION

1.19.4 Memorandum

1. 62; 63

2.1 9
2.2 132
2.3 17
2.4 331
2.5 498
2.6 68.5
2.7 1 000
2.8 144
2.9 +
2.10 10
2.11 63
2.12 176
2.13 7
2.14 4
2.15 450

1.19.5 LEANER SECTION

1.19.5.1 Content

1.19.5.2 ACTIVITY:To perform mental calculations [LO 1.9.1]

1. See how many figures you can find in this garden and then add them together. If you work cleverly you will be able to calculate the answers in a flash! Are you able to see how?

---

[19] This content is available online at <http://cnx.org/content/m20045/1.1/>.

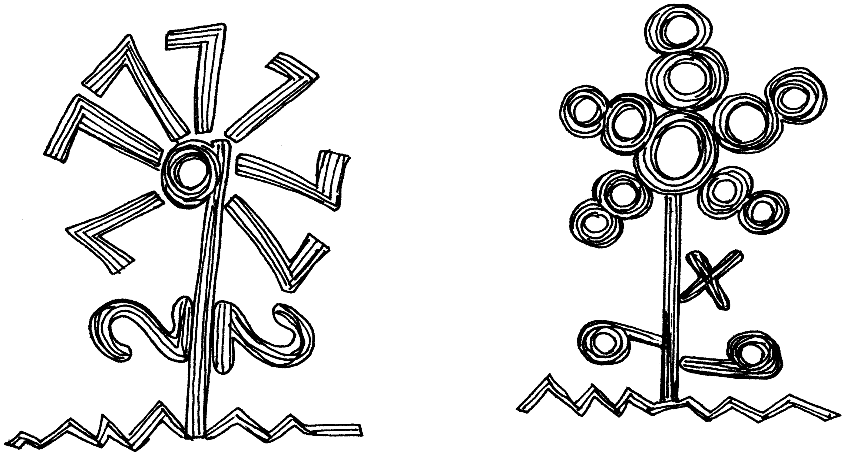


Figure 1.19

What is your answer? ____

2. Now we are going to test your mental calculation skills in a different way. If you know your multiplication tables and can also add and subtract well, you will not have any trouble. Try to complete these within three minutes:

2.1 _____________ x 8 = 72
2.2 _____________ ÷ 11 = 12
2.3 119 + ______________ = 136
2.4 _______________ - 214 = 117
2.5 Double 249: ___________________
2.6 Halve 137: ____________________
2.7 30 x __________________ = 30 000
2.8 4 x 3 x 12 = _________________
2.9 567 _________________ 23 = 590
2.10 8 670 ÷ ______________ = 867
2.11 (5 x 9) + 18 = ______________
2.12 (7 + 15) x 8 = _______________
2.13 (42 ÷ _____________) + 14 = 20
2.14 (5 x _________________) – 9 = 11
2.15 Halve x ____________________ = 225

Complete by colouring in the appropriate block:

I did	WELL	AVERAGE	POORLY	

Table 1.18

1.19.5.2.1 DO YOU STILL REMEMBER?

The answer to an addition sum is called the SUM.

Thus: 4 873 + 2 168 = 7 041

addend addend sum
3. Some more mental calculation!
Calculate the answers without using a calculator. Use the code and complete the following sentence:
Subtraction is called the ____ of addition.
3.1 27 + 35
3.2 48 + 16
3.3 53 + 19
3.4 23 + 37
3.5 39 + 17
3.6 15 + 24
3.7 26 + 34

I	A	N	K	V	O	E
62	74	64	102	72	88	60

Table 1.19

B	R	Y	S	P	M	T
31	56	20	39	99	52	32

Table 1.20

We can also say that subtraction is the in**verse operation** of addition. I can test an addition sum by subtracting.

1.19.6 Assessment

Learning Outcome 1:The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.9: We know this when the learner performs mental calculations involving:
1.9.1: addition and subtraction.

1.20 To calculate by selecting operations appropriate to solving problems[20]

1.20.1 MATHEMATICS

1.20.2 Number Concept

1.20.3 EDUCATOR SECTION

1.20.4 Memorandum

1.1 3 272 + 128 = 3 400
1 154 + 136 = 1 290
1 103 + 97 = 1 200
SUM = 5 890
1.2 138 + 622 = 760

---

[20] This content is available online at <http://cnx.org/content/m20047/1.1/>.

259 + 11 011 = 11 270

235 + 25 = 4 260

SUM: = 16 290

2.1 Wrong: 640 + 360 + 5 + 2 – 2 = 1 005

2.2 Wrong: 2 500 + 360 = 2 880

Brain Teaser

1. 41 186 + 23 880 + 12 = 65 078

2. 758 817 + 100 + 118 200 – 4 = 875 113

Various other possibilities

1.20.5 LEANER SECTION

1.20.5.1 Content

1.20.5.2 ACTIVITY: To calculate by selecting operations appropriate to solving problems [LO 1.8.2]

1.20.5.2.1 DO YOU STILL REMEMBER?

Addition is easier when we GROUP numbers.

Look carefully at the following example:

37 + 28 + 12 + 16 + 13 + 44

If we group the numbers they look like this: 37 + 13 = 50

28 + 12 = 40

44 + 16 = 60

SUM = 150

Understand? We group the numbers like this because we want to “complete” the tens, so that it is easier to add.

1. Group the following numbers so that you can add them more easily:

1.1 3 272 ; 1 154 ; 97 ; 128 ; 136 ; 1 103

__________________ + __________________ = __________________

__________________ + __________________ = __________________

__________________ + __________________ = __________________

SUM = __________________

1.2 138 ; 259 ; 4 235 ; 25 ; 11 011 ; 622

__________________ + __________________ = __________________

__________________ + __________________ = __________________

__________________ + __________________ = __________________

SUM = __________________

2. Work with a friend and determine whether the answers of the following calculations are correct. If they are not, indicate the error.

2.1 638 + 367 = 640 + 360 – 5 = 995

2.2 2 496 + 364 = 2 600 + 360 = 2 960

1.20.5.2.2 BRAIN TEASER!

You are supposed to complete the following with a calculator, but the 9 on your calculator doesn’t work! How will you solve the problem? Write down everything you key in and calculate the answer:

1. 41 186 + 23 892

____

____

____

2. 756 917 + 118 196

____
____
____

1.20.5.2.3 TIME FOR SELF-ASSESSMENT

How do you feel about the work so far? Please give us some indication of how you feel about the work that we have completed by now. Make a tick in the appropriate column:

	Not at all	Fairly well	Well	Really well
I know what "sum of" means.	________	________	________	________
I can explain the word "inverse".	________	________	________	________
I can group numbers to add them more easily. (LO1.8)	________	________	________	________

Table 1.21

1.20.6 Assessment

Learning Outcome 1:The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.8: We know this when the learner estimates and calculates by selecting and using operations appropriate to solving problems that involve:

1.8.2: addition and subtraction of whole numbers.

1.21 To recognise and use the properties of addition[21]

1.21.1 MATHEMATICS

1.21.2 Number Concept

1.21.3 EDUCATOR SECTION

1.21.4 Memorandum

1.1 True
1.2 True
1.3 True
2.1 2 236 994
2.2 1 198 235 + 469 203
2.3 264 059 = 1 269 055

---

[21] This content is available online at <http://cnx.org/content/m20048/1.1/>.

1.21.5 LEANER SECTION

1.21.5.1 Content

1.21.5.2 ACTIVITY: To recognise and use the properties of addition [LO 1.12.2]

1. Do you still remember this? In grade 5 (Module 1) we looked at the properties of addition. Now you must use this knowledge!

Work with one of your friends and decide whether the following are true or false. You may use your pocket calculator:

1.1 2 623 896 + 2 346 213 = 2 346 213 + 2 623 896

____

1.2 54 236 + (28 912 + 46 852) = (54 236 + 28 912) + 46 852

____

1.3 (128 435 + 239 416) + 1 379 538 = 128 435 + (239 416 + 1 379 538)

____

2. Complete the following without a calculator by filling in the missing numbers:

2.1 456 213 + = 2 236 994 + 456 213

2.2 1 198 235 + (469 203 + 2 069 523) = (_____________ + _____________) + 2 069 523

2.3 (264 059 + 3 016 438) + 1 269 055 = _____________ + (3 016 438 + _____________)

1.21.6 Assessment

Learning Outcome 1:The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.12: We know this when the learner recognises, describes and uses:

1.12.2: the commutative, associative and distributive properties with whole numbers (the expectation is that learners should be able to use the properties and not necessarily know the names).

1.22 To perform mental calculations[22]

1.22.1 MATHEMATICS

1.22.2 Number Concept

1.22.3 EDUCATOR SECTION

1.22.4 Memorandum

1.1 6
1.2 12
1.3 775
1.4 9
1.5 11
1.6 3 700
1.7 9 rem 3
1.8 6 rem 5
1.9 6 248
1.10 504
1.11 350
1.12 45

---

[22] This content is available online at <http://cnx.org/content/m20049/1.1/>.

1.13 8
1.14 19 000
1.15 1 rem 16

1.22.5 LEANER SECTION

1.22.5.1 Content

1.22.5.2 ACTIVITY: To perform mental calculations [LO 1.9.1, LO 1.9.2]

1. By this time you will have realised how important it is to develop a quick mind and do without a pencil and paper. Answer the following questions as quickly and accurately as possible and see whether you are able to improve on the results of your previous mental calculation test:

1.1 54 ÷ 9 = ________________________
1.2 __________________________ x 8 = 96
1.3 5 000 – 4 225 = ___________________
1.4 (7 x ____________________) + 9 = 70
1.5 (9 x 5) - ____________________ = 34
1.6 2 575 + 1 125 = ___________________
1.7 84 ÷ 9 = _________________________
1.8 53 ÷ 8 = _________________________
1.9 Double 3 124: ______________________
1.10 Halve 1 008: _______________________
1.11 250 + 75 + 25 = ___________________
1.12 (12 x 12) - ___________________ = 99
1.13 (42 + ______________) x 1 000 = 50 000
1.14 Round off to the nearest 1 000: 19 450 : ___________________
1.15 (9 x 12) ÷ 92 = ________________________
Complete: I have _______________________________ correct!

My marks have	DROPPED	REMAINED THE SAME	IMPROVED

Table 1.22

1.22.6 Assessment

Learning Outcome 1:The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.9: We know this when the learner performs mental calculations involving:

1.9.1: addition and subtraction;

1.9.2: multiplication of whole numbers to at least 12 x 12.

1.23 To solve problems in context[23]

1.23.1 MATHEMATICS

1.23.2 Number Concept

1.23.3 EDUCATOR SECTION

1.23.4 Memorandum

1.23.5 LEANER SECTION

1.23.5.1 Content

1.23.5.2 ACTIVITY: To solve problems in context [LO 1.6.1/2]

1.23.5.3 To use a range of techniques to perform calculations [LO 1.10.1/5]

1.23.5.4 To use a range of strategies to check solutions [LO 1.11]

In the previous activity you practised your mental skills. On the other hand it is also important to be able to calculate correctly by using pencil and paper. Form groups of three. Your teacher will provide the paper you need. Then execute the following assignments neatly and accurately.

1. Solve the following problems:

1.1 Mr Dlamini has won a competition and would like to buy each of his three sons a house. He sees the following advertisements:

House A: R895 000
House B: R795 799
House C: R799 495

What will the three houses cost Mr Dlamini?

1.2 Nancy sees an exhibition of dinosaurs in a museum. The weights of the three dinosaurs are given as follows:

A: 45 875 kg
B: 9 324 kg
C: 26 879 kg

What is the combined weight of the dinosaurs?

1.3 The registration figures for the "Long-winded Marathon" are as follows:

2002: 24 513
2003: 31 687
2004: 42 196

How many entries have there been in the marathon up to now?

2. Check you answers using your pocket calculator.
3. Explain to the class how your group has arrived at the answers.
4. Compare your methods with those of the other groups. How do they differ?

1.23.5.4.1 TIME FOR GROUP ASSESSMENT

Assess your work on a scale of 1 – 4 and circle the appropriate number

1 = needs more attention
2 = fairly good
3 = very good
4 = excellent

---

[23] This content is available online at <http://cnx.org/content/m20052/1.1/>.

Criteria:	Needs attention	Fairly good	Very good	Ex-cellent
All group members participated in the activity.	1	2	3	4
Group members listened to each other.	1	2	3	4
Group members helped and encouraged each other.	1	2	3	4
Group members adhered to the instructions.	1	2	3	4
Each one had a chance to speak.	1	2	3	4
The group's work was neatly done.	1	2	3	4
The answers were calculated correctly.	1	2	3	4

Table 1.23

1.23.6 Assessment

Learning Outcome 1:The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.6: We know this when the learner solves problems in context including contexts that may be used to build awareness of other Learning Areas, as well as human rights, social, economic and environmental issues such as:

1.6.1: financial (including buying and selling, profit and loss, simple budgets, reading and interpreting accounts, and discount);

1.6.2: measurements in Natural Sciences and Technology contexts.

Assessment Standard 1.10: We know this when the learner uses a range of techniques to perform written and mental calculations with whole numbers including:

1.10.1: adding, subtracting and multiplying in columns;

1.10.5: using a calculator.

Assessment Standard 1.11: We know this when the learner uses a range of strategies to check solutions and judge the reasonableness of solutions.

1.24 To determine the equivalence and validity of different representations[24]

1.24.1 MATHEMATICS

1.24.2 Number Concept

1.24.3 EDUCATOR SECTION

1.24.4 Memorandum

2. Learner's own method
   3.1 9 080 717
   3.2 8 301 883

- 6 485 185

1.24.4.1 Brain Teaser

1. 4 2. 1
   3 2
   1 3
   2 3
   1 44
   8 1

1.24.5 LEANER SECTION

1.24.5.1 Content

1.24.5.2 ACTIVITY: To determine the equivalence and validity of different representations [LO 2.6.3]

1.24.5.3 To use strategies to check solutions [LO 1.11]

1. In the previous activity you had the opportunity to use your own strategies to solve problems. From the feedback in the class you would have realised that there are many ways of adding numbers.

Work in pairs. Discuss the following methods of adding and explain to each other how the answers are calculated:

1.24.5.3.1 LET'S REVISE!

1.1 845 908 + 25 876 + 343 621

	800 000	+	40 000	+	5 000	+	900	+	0	+	8
			20 000	+	5 000	+	800	+	70	+	6
+	300 000	+	40 000	+	3 000	+	600	+	20	+	1
	1 100 000	+	100 000	+	13 000	+	2 300	+	90	+	15

Table 1.24

---

[24] This content is available online at <http://cnx.org/content/m20054/1.1/>.

= 1 000 000 + (100 000 + 100 000) + 10 000 + (3 000 + 5 000) + 300 + (90 + 10) + 5
= 1 215 405
1.2

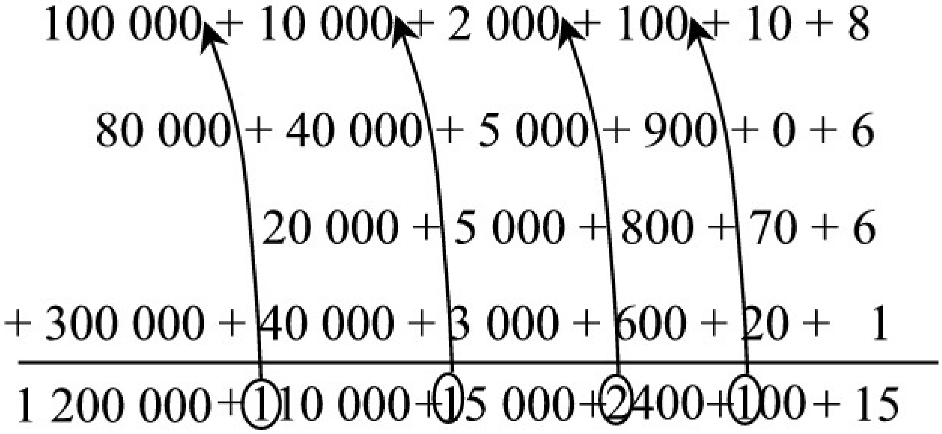


Figure 1.20

= 1 215 405
1.3

		1	1	1	2	1	
		8	4	5	9	0	8
			2	5	8	7	6
+		3	4	3	6	2	1
	1	2	1	5	4	0	5

Table 1.25

2. Can you show your friend any other method of calculation?

____

____

____

____

____

____

3. Use any method of your choice (without a calculator) and calculate the sum of:
3.1 4 623 577 + 1 239 246 + 3 217 894

____

____

____

____

____

3.2 2 851 416 + 4 981 235 + 469 232

____

____

____

____

____

3.3 2 153 892 + 264 058 + 4 067 235

____

____

____

____

____

____

1.24.5.3.2 BRAIN TEASERS!

Complete the missing numbers:

1.

1.		2	1	3	4	1	___		2.		___	7	9	1	2	3
			8	9	2	___	7				4	___	2	8	1	6
		1	7	5	___	9	2				1	1	___	2	3	3
		___	1	4	1	1	9				1	0	0	___	7	1
	+	1	___	9	1	2	3			+	1	4	3	0	___	___
		___	1	___	0	8	5				9	5	8	5	8	7

Table 1.26

1.24.5.4 TIME FOR SELF-ASSESSMENT

- Tick the appropriate rectangle:

	Yes	Mostly	Some-times	No
I can investigate adding methods and evaluate them (determine whether they are correct). (LO 1.11 en LO 2.6)				*

continued on next page

I can add correctly without a calculator. (LU 1.8)				*
I need more exercise in addition.	*			

Table 1.27

* *Ask your educator to explain again and give you extra exercises.*

1.24.6 Assessment

Learning Outcome 1:The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.11: We know this when the learner uses a range of strategies to check solutions and judge the reasonableness of solutions.

Learning Outcome 2:The learner will be able to recognise, describe and represent patterns and relationships, as well as to solve problems using algebraic language and skills.

Assessment Standard 2.6: We know this when the learner determines, through discussion and comparison, the equivalence of different descriptions of the same relationship or rule presented:

2.6.3: e.g. number sentences.

1.25 To solve problems in context[25]

1.25.1 MATHEMATICS

1.25.2 Number Concept

1.25.3 EDUCATOR SECTION

1.25.4 Memorandum

1.1 12 November 2001
5 November 2001
1.2 R94,98
1.3 10
1.4 14%
14%
1.5 maps
Cash
1.6 Anneke
1.7 R25,00
1.8 820:14
15:30

- Cashier 101
- No payment

2. R9 + R12 + R9 + R4 + R2 + R4 = R40
3.1 1 litre full cream milk

---

[25] This content is available online at <http://cnx.org/content/m20055/1.1/>.

- kg chicken pieces
- litre Coke

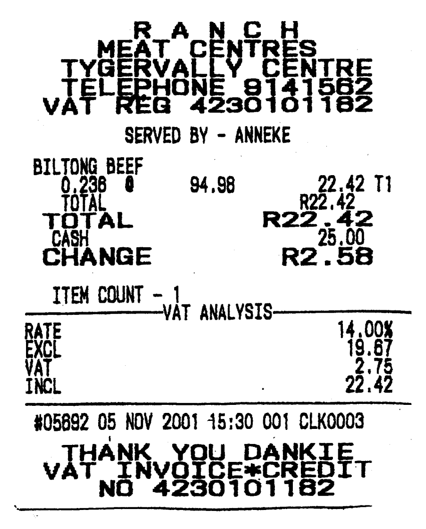
410 g Surf maid peas
200 g Niknaks
5 litre Vanilla ice cream
1 Sasko Sam bread
3.2 Prices will vary from shop to shop
3.3 Calculate according to prices in 3.2
3.4 Calculate according to prices in 3.3

1.25.5 LEANER SECTION

1.25.5.1 Content

1.25.5.2 ACTIVITY: To solve problems in context [LO 1.6.1]

When we buy something in a shop we receive a cash slip. We need to be able to understand and "read" the slip. If not, we will not be able to check if it really reflects what we have bought and paid for. Look at the following examples:

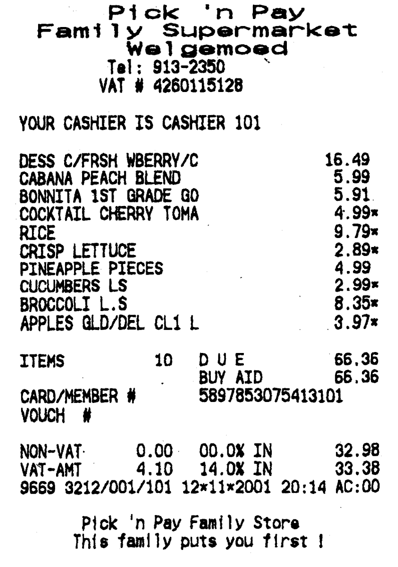


```
      R A N C H
    MEAT CENTRES
  TYGERVALLY CENTRE
  TELEPHONE 9141562
 VAT REG 4230101182

     SERVED BY - ANNEKE

BILTONG BEEF
  0.236 @    94.98      22.42 T1
  TOTAL                R22.42
TOTAL                 R22.42
 CASH                   25.00
CHANGE                 R2.58

 ITEM COUNT - 1
-----------VAT ANALYSIS-----------
RATE                    14.00%
EXCL                     19.67
VAT                       2.75
INCL                     22.42
----------------------------------
#05692 05 NOV 2001 15:30 001 CLK0003
   THANK YOU DANKIE
 VAT INVOICE*CREDIT
   NO 4230101182
```



```
          Pick 'n Pay
     Family Supermarket
          Welgemoed
        Tel: 913-2350
      VAT # 4260115128

YOUR CASHIER IS CASHIER 101

DESS C/FRSH WBERRY/C           16.49
CABANA PEACH BLEND              5.99
BONNITA 1ST GRADE GO            5.91
COCKTAIL CHERRY TOMA            4.99*
RICE                            9.79*
CRISP LETTUCE                   2.89*
PINEAPPLE PIECES                4.99
CUCUMBERS LS                    2.99*
BROCCOLI L.S                    8.35*
APPLES GLD/DEL CL1 L            3.97*

ITEMS           10   D U E      66.36
                     BUY AID    66.36
CARD/MEMBER #        5897853075413101
VOUCH  #

NON-VAT      0.00   00.0% IN    32.98
VAT-AMT      4.10   14.0% IN    33.38
9669 3212/001/101 12*11*2001 20:14 AC:00

     Pick 'n Pay Family Store
    This family puts you first !
```

Table 1.28

1. Study the above examples and then answer the following questions:
1.1 When were the purchases made at
Pick 'n Pay? ____
Ranch Meat Centre? ____
1.2 What does the biltong cost per kg? _________________________________
1.3 How many items were bought from Pick 'n Pay? ___________________________
1.4 What % tax had to be paid at
Pick 'n Pay? ____
Ranch Meat Centre? ____
1.5 How (with what) did the client pay at
Pick 'n Pay? ____

Ranch Meat Centre? ____

1.6 Who was the cashier at Ranch Meat Centre? ____________________________

1.7 What amount did the customer give her? _______________________________

1.8 At what time were the purchases made at

Pick 'n Pay? ____

Ranch Meat Centre? ____

1.9 If your purchases are not according to the slip, how will you know which cashier helped you at Pick a Pay if you cannot remember what he/she looked like?

____

____

____

1.10 What does the * next to a few of the amounts on the Pick 'n Pay slip mean?

____

____

____

1.25.5.2.1 DO YOU STILL REMEMBER?

Explain to a friend how we round off to the nearest 10, 100 and 1 000.

** Can you explain how we would round off to the nearest 10 000?

2. When we go shopping, we can estimate to the nearest rand whether we will have enough money to pay.

Look at the following slip. Round off to the nearest rand and estimate how much you will have to pay for your shopping.

LAMB	
0.360 Kg @ R25.98 / Kg	
R9.35	______________
LAMB	
0.444 Kg @ R25.98 / Kg	
R11.54	______________
SWEET CORN R8.79	______________
SQUASH	
1.295 Kg @ R3.29 / Kg	
R4.26	______________
SWEET POTATOES	
0.686 Kg @ R2.99 / Kg	
R2.05	______________
GOOD MORNING H R3.79	______________
COOKED HAM	
0.288 Kg @ R44.95 / Kg	
R12.95	______________

Table 1.29

3. Confused Cathy's shopping list is completely wrong!
3.1 Write the shopping list down correctly.
____
____
____
____
____
____
3.2 Find out what each item will cost at your nearest supermarket and write it down.
____
____
____
____
____
____
3.3 Use your calculator and calculate what this shopping will cost you.
____
____
____
____
3.4 If you pay with a R100 note, how much change will you get?
____
____
____
____

1.25.5.2.2 DO YOU STILL REMEMBER?

Your calculator has a memory that you can use to do calculations with more than one operation correctly.
M+ : enables the calculator to save or memorise the answer
MR / RCM : these keys are pressed if you want to retrieve the memorised answers
e.g. (347 219 + 34 987) + (296 553 + 1 897 320)
Key in 347 219 + 34 987 = M+
Then key in 296 553 + 1 897 320 = M+
Then key in MR or RCM

1.25.6 Assessment

Learning Outcome 1:The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.6: We know this when the learner solves problems in context including contexts that may be used to build awareness of other Learning Areas, as well as human rights, social, economic and environmental issues such as:

1.6.1: financial (including buying and selling, profit and loss, simple budgets, reading and interpreting accounts, and discount).

1.26 To use a range of techniques for performing calculations[26]

1.26.1 MATHEMATICS

1.26.2 Number Concept

1.26.3 EDUCATOR SECTION

1.26.4 Memorandum

1. Amount will vary according to size of the learner's family and the age of the children in the family.
   Brain Teaser
   233 + 27 – 53 + 29 – 41 + 13 – 18 = 190

1.26.5 LEANER SECTION

1.26.5.1 Content

1.26.5.2 Activity: To use a range of techniques for performing calculations [LO1.10.5]

1. Study the notice and then answer the questions that follow. You may use your calculator. (Remember the memory keys!)

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[26] This content is available online at <http://cnx.org/content/m20056/1.1/>.

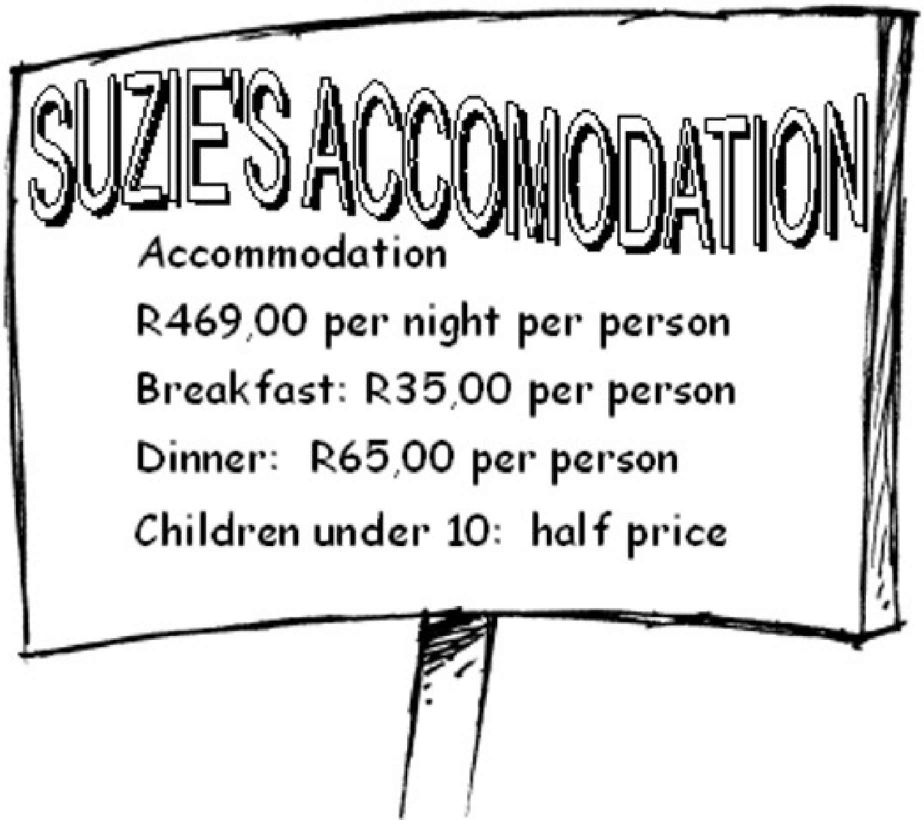
SUZIE'S ACCOMODATION
Accommodation
R469,00 per night per person
Breakfast: R35,00 per person
Dinner: R65,00 per person
Children under 10: half price

Figure 1.21

- What amount will your father have to pay if your family stays one night at "Suzie's Accommodation"?
- You eat dinner and breakfast before leaving again.
- Explain how you calculated your answer!

1.26.5.2.1 TIME FOR SELF-ASSESSMENT

It is important for us to know how you feel about the work that we have completed. Consider the criteria and colour the block that reflects how you feel.

I can "analyse" a till slip and answer questions about it correctly.

I can "analyse" a till slip and answer questions about it correctly.	Not at all	Fairly well	Well	Really well
I can use the memory keys on the calculator correctly.	Not at all	Fairly well	Well	Really well
I was able to calculate the amount of the family's accommodation correctly.	Not at all	Fairly well	Well	Really well

Table 1.30

1.26.5.2.2 BRAIN TEASER!

Vusi is a passenger on a ferry. He notes that at the first stop 18 people get on and 13 get off. At the next stop 41 people get on and 29 get off. At the third stop 53 people get on and 27 get off. If there were then 233 people left on the ferry, how many people were on the ferry when Vusi got on?

_ _

_ _

_ _

_ _

_ _

_ _

_ _

_ _

_ _

_ _

_ _

_ _

1.26.6 Assessment

Learning Outcome 1:The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.10: We know this when the learner uses a range of techniques to perform written and mental calculations with whole numbers including:

1.10.5: using a calculator.

1.27 To solve problems in context[27]

1.27.1 MATHEMATICS

1.27.2 Number Concept

1.27.3

1.27.4 EDUCATOR SECTION

1.27.5 Memorandum

1.27.6 TEST 2

1. 1.1 Sum
   1.2 Substraction
   2. 2.1 True

- True

3. 2 382 + 12 018 = 14 400
   4 214 + 45 116 = 49 330
   = 63 730
   4. 4.1 1 143 269
   4.2 5 261 380 + 43 826
   5.1 R13 + R54 + R8 + R130 = R205
   5.2 R204,32
   6. 7 637 261
   7.1 8 035 933
   7.2 8 621 704

1.27.7 LEANER SECTION

1.27.7.1 Content

1.27.7.2 Activity: To solve problems in context [LO1.6.1]

** This is a task for your portfolio – do it without your pocket calculator! Be sure that you really understand what you have to do. Consider the assessment criteria before you start! Ask your educator for the paper that you will need:

1. Page through the local newspaper and find three advertisements that offer houses for sale. The prices should all be more than one million rand. Cut out the advertisements neatly and paste them on your sheet of paper. Calculate the combined price of the three houses.

2. Page through the newspaper again to find three examples of flats that are for sale. Also cut these out neatly and paste them on your paper. Calculate the combined price of the most expensive and the least expensive flats.

3. Now look for examples of three cars that are for sale. These must also be cut out and pasted neatly. Calculate the combined cost of the three cars.

4. Now select one house or flat and one car and calculate what you will have to pay for these items.

1.27.7.2.1 ASSESSMENT: NEWSPAPER-RELATED ACTIVITY

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[27] This content is available online at <http://cnx.org/content/m20060/1.1/>.

Criteria	1	2	3	4
Neatness	Cut out untidily. Badly pasted.	Cut out untidily.Pasted.	Cut out fairly neatly. Pasted reasonably neatly.	Very neatly cut out and well glued.
Completeness	Hardly any of the instructions have been carried out.	Only half of the instructions have been carried out.	1 or 2 instructions have not been carried out.	All instructions have been completed.
Correctness of calculations	All calculations are incorrect.	Many mistakes occur.	Few mistakes occur.	All answers are correctly calculated.

Table 1.31

1.27.8 TEST

1. Fill in the missing words:

1.1 The answer of an addition sum is called the ______________________________

1.2 ____________________________ is the inverse of addition. (2)

2. True / False:

2.1 27 more than 12 849 is 12 876.

2.2 869 213 is 9 100 more than 860 113. (2)

3. Calculate the answers to the following by grouping the numbers:

2 382 + 4 214 + 12 018 + 45 116

_____________________ + _____________________ = _____________________

_____________________ + _____________________ = _____________________

= _____________________ (5)

4. Fill in the missing numbers:

4.1 123 896 + 1 143 269 = _____________________ + 123 896

4.2 5 261 380 + (43 826 + 45 793) = (_____________________ + _____________________) + 45 793 (3)

5. Nancy is shopping and packs the following items in her basket:

Mini tea cookies - R 12,69
Meat - R 54,29
Cheese - R 7,84
Frying pan - R129,50

5.1 Calculate how much money she needs by rounding off to the nearest rand.

____

____

____

____

____

(5)

5.2 Calculate the exact amount that she has to pay:

____

____

____

____

(2)

6. Ebrahim had to calculate the following: 4 167 809 + 3 469 452
He forgot to complete the sum. Now do it on his behalf:
4 1 6 7 8 0 9
+ 3 4 6 9 4 5 2
7 _ 3 _ _ 6 _ (2)
7. Calculate the following by using the shortest method possible:
7.1 4 138 269 + 3 897 664

____
____
____
____
(2)

7.2 5 963 287 + 2 658 417

____
____
____
____
(2)

- Complete by colouring in the appropriate block:

I am

COMPLETELY READY
NOT QUITE READY YET
NOT READY AT ALL

Table 1.32

to advance to the next Learning Unit.

1.27.9 Assessment

Learning Outcome 1:The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.6: We know this when the learner solves problems in context including contexts that may be used to build awareness of other Learning Areas, as well as human rights, social, economic and environmental issues such as:

1.6.1: financial (including buying and selling, profit and loss, simple budgets, reading and interpreting accounts, and discount).

1.28 To perform mental calculations[28]

1.28.1 MATHEMATICS

1.28.2 Subtraction

1.28.3

1.28.4 EDUCATOR SECTION

1.28.5 Memorandum

1. 4
    2.1 2 4
    2.2 3 3
    2.3 6 6
    2.4 5 5
    2.5 1 5
    2.6 7 2
    2.7 3 6

- Lets review

Difference
    Addition

- Do you remember

Only 2 factors have/can only be divided by 1 and itself.
    Always divisible by 2.
    1. 13 – 7 5. 91 - 3
    2. 31 – 3 6. 97 - 7
    3. 53 – 5 7. 59 – 7
    4. 71 – 11

1.28.6 LEANER SECTION

1.28.6.1 Content

1.28.6.2 Activity: To perform mental calculations [LO 1.9.1]

1. How accurately can you still subtract? The grid contains a hidden number. Use the clues to colour in the blocks that will reveal the number.
    1.1 14 – 9
    1.2 17 – 8
    1.3 21 – 7
    1.4 23 – 6
    1.5 20 – 12
    1.6 42 – 13
    1.7 45 – 18
    1.8 39 – 16
    1.9 34 – 15
    1.10 104 – 7

---

[28] This content is available online at <http://cnx.org/content/m20063/1.1/>.

1.11 106 – 8
1.12 103 – 8
1.13 101 – 5

2	12	106	8	18	19
81	66	70	21	5	63
101	12	50	14	117	80
64	73	9	109	68	76
7	98	86	29	22	72
27	96	38	17	8	97
88	71	11	95	83	3

Table 1.33

1.28.6.3 What is the hidden number? ____

2. More fun!

You must now think carefully. Do you still remember what the "inverse" of subtraction is? This may help us find the answer to subtraction sums quickly. Work with a partner and see who is the first one to identify the figure that is hidden behind each cloud!

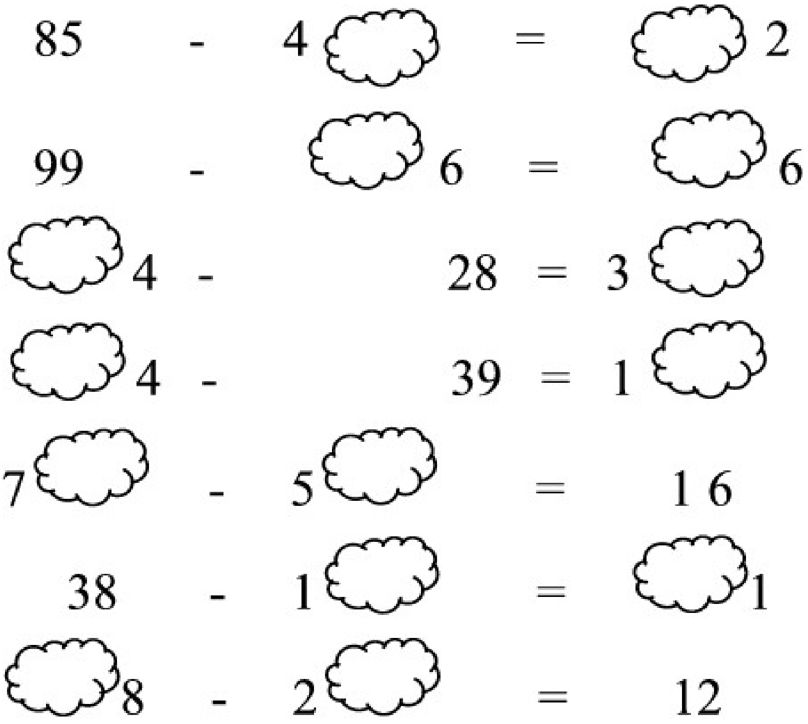

Figure 1.22

1.28.6.3.1 Let's revise!

- Do you still remember?

The answer to a subtraction sum is called the .

The inverse of subtraction is

1.28.7 Assessment

Learning Outcome 1:The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.9: We know this when the learner performs mental calculations involving:

1.9.1: addition and subtraction.

1.29 To calculate by selecting operations appropriate to solving problems[29]

1.29.1 MATHEMATICS

1.29.2 Subtraction

1.29.3

1.29.4 EDUCATOR SECTION

1.29.5 Memorandum

1.29.6 LEANER SECTION

1.29.6.1 Content

1.29.6.2 Activity: To calculate by selecting operations appropriate to solving problems [LO 1.8.1]

1. It is still important to remember how to round off numbers, because this is a method that you may be able to use to quickly calculate the difference.

1.1 Work with a partner to determine the difference, by rounding off both numbers to the nearest 10. Take turns to give the answers.

a) 276 – 95
b) 415 – 109
c) 647 – 142
d) 999 – 351

2. Can you calculate the difference between the following numbers quicker than your partner? First round off the numbers to the nearest 100.

2.1 1 325 – 876
2.2 3 764 – 1 321
2.3 6 009 – 4 245
2.4 9 999 – 7 908

How well do you remember?

Complete the following:

A prime number is a number that____
____
____

An even number is.____
____
____

1.29.6.3 Brainteaser!

Two prime numbers can be subtracted to give an even number as answer, e.g. 19 – 5 = 14

Can you find the correct prime numbers to make the following number sentences true?

1. ____________________ – ____________________ = 6
2. ____________________ – ____________________ = 28
3. ____________________– ____________________ = 48
4. ____________________ – ____________________ = 60
5. 88 = ____________________ – ____________________
6. 90 = ____________________ – ____________________

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[29] This content is available online at <http://cnx.org/content/m20071/1.1/>.

7. 52 = ___________________ – ___________________

1.29.7 Assessment

Learning Outcome 1:The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.8: We know this when the learner estimates and calculates by selecting and using operations appropriate to solving problems that involve:

1.8.1: rounding off to the nearest 5, 10, 100 or 1 000.

1.30 To perform mental calculations[30]

1.30.1 MATHEMATICS

1.30.2 Subtraction

1.30.3

1.30.4 EDUCATOR SECTION

1.30.5 Memorandum

1.1 8 1.9 176
1.2 132 1.10 7
1.3 17 1.11 4
1.4 330 1.12 500
1.5 100 1.13 718
1.6 + 1.14 218 $\frac{1}{2}$
1.7 100 1.15 10 000
1.8 54

1.30.6 LEANER SECTION

1.30.6.1 Content

1.30.6.2 Activity: To perform mental calculations [LO 1.9.1, LO 1.9.2]

1. Until now your mental calculation skills have been of cardinal importance to the activities. This is another opportunity to improve these skills further. Let us see how well you perform in the following mental calculation test. Work as quickly and accurately as possible.

1.1 ________________________ × 9 = 72
1.2 ________________________ ÷ 11 = 12
1.3 119 + ________________________ = 136
1.4 ________________________ – 213 = 117
1.5 30 × ________________________ = 3 000
1.6 967 ________________________ 23 = 990
1.7 86 700 ÷ ________________________ = 867
1.8 (4 × 9) + 18 = ________________________
1.9 (7 + 15) x 8 = ________________________
1.10 (42 ÷ ________________________) + 14 = 20
1.11 (5 × ________________________) – 9 = 11
1.12 Halve × ________________________ = 225

---

[30] This content is available online at <http://cnx.org/content/m20072/1.1/>.

1.13 Double: 359: ________________________
1.14 Halve: 437: ________________________
1.15 104 = ________________________
Complete: I have answered ________________________________ correctly!

1.30.7 Assessment

Learning Outcome 1:The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.9: We know this when the learner performs mental calculations involving:
1.9.1: addition and subtraction;
1.9.2: multiplication of whole numbers to at least 12 x 12.

1.31 To describe and illustrate number systems that differ from our own[31]

1.31.1 MATHEMATICS

1.31.2 Subtraction

1.31.3

1.31.4 EDUCATOR SECTION

1.31.5 Memorandum

1. Before Christ
2. 5 502 / (will be +1 each year)
3.
3.1 900 000
3.2 9 000
3.3 999 900
3.4 0 990
3.5 990 000

1.31.6 LEANER SECTION

1.31.6.1 Content

1.31.6.1.1 Activity: To describe and illustrate number systems that differ from our own [LO 1.2]

Did you know?

The Egyptians used pictograms to represent numbers as long ago as
3500 B.C. Pictograms looked like these:

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[31] This content is available online at <http://cnx.org/content/m20073/1.1/>.

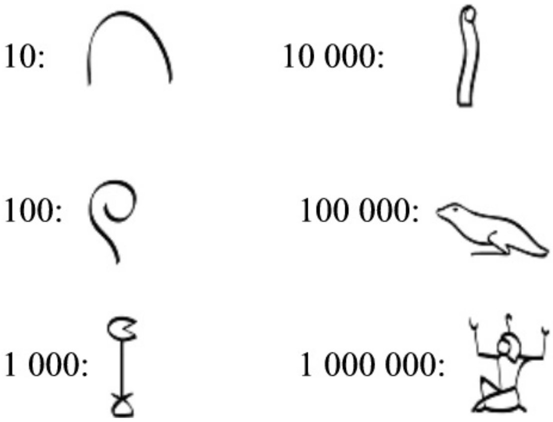

Figure 1.23

1. What does B.C. mean?

____

2. How many years ago was this?

____

3. Calculate the following. Use contemporary digits for your answers.

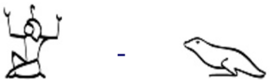

Figure 1.24

3.1 ______________________

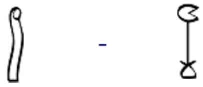

Figure 1.25

3.2 = .______________________

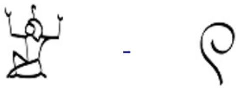

Figure 1.26

3.3 = _

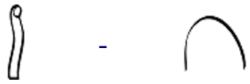

Figure 1.27

3.4 = _

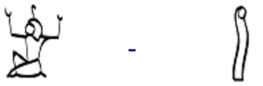

Figure 1.28

3.5 = _

TIME FOR SELF-ASSESSMENT

Let's see how well you are managing. Read the criteria and place a tick in the appropriate block:

	1	2	3	4
I know what the answer to a subtraction sum is called.	_ _ _ _ _ _ _	_ _ _ _ _ _ _	_ _ _ _ _ _ _	_ _ _ _ _ _ _

continued on next page

I can calculate differences by rounding off to the nearest 10 and 100 (LO 1.8)	_______	_______	_______	_______
I know what a prime number is (LO 1.3)	_______	_______	_______	_______
I know what an even number is (LO 1.3)	_______	_______	_______	_______
I understand the Egyptian pictograms and can use them to subtract (LO 1.2)	_______	_______	_______	_______

Table 1.34

1.31.7 Assessment

Learning Outcome 1:The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.2: We know this when the learner describes and illustrates written number systems different to own.

1.32 To determine the equivalence and validity of different methods[32]

1.32.1 MATHEMATICS

1.32.2 Subtraction

1.32.3

1.32.4 EDUCATOR SECTION

1.32.5 Memorandum

1.1 378 767
1.2 366 269
1.3 613 751

1.32.6 LEANER SECTION

1.32.6.1 Content

1.32.6.1.1 Activity: To determine the equivalence and validity of different methods [LO 2.6.3]

1.32.6.1.2 To use strategies to check solutions [LO 1.11]

1. In the previous activity you saw a variety of methods to do computations. Let's have a look at further ways of finding the difference. Divide into groups of three. Read through the following problem carefully.

---

[32] This content is available online at <http://cnx.org/content/m20079/1.1/>.

Your educator will allocate numbers to the groups and indicate which solution each group should look at. First discuss the solution and then explain it to the rest of the class.

What is the subtrahend if the minuend is 631 524 and the difference is 254 637?
1.1 I subtract by counting backwards:
631 524 – 254 637
631 524 – 200 000

- 431 524 – 50 000
- 381 524 – 4 000
- 77 524 – 600
- 376 924 – 30
- 376 894 - 7

= 376 887
The subtrahend is 376 887.
1.2 I use the rule of compensation for subtraction.
631 524 – 254 637
+ 363 + 363

- 631 887 – 255 000

+ 5 000 + 5 000

- 636 887 – 260 000

376 887

- I work with negative numbers and write them as follows:

631 524	
254 637	
-3	(4 – 7)
-10	(20 – 30)
-100	(500 – 600)
-3 000	(1 000 – 4 000)
-20 000	(30 000 – 50 000)
400 000	(600 000 – 200 000)
376 887	(400 000 – 20 000 – 3 000 – 100 – 10 – 3)

Table 1.35

1.4 This is a short method for determining the subtrahend:
5 12 10 14 11 14
6 3 1 5 2 4
- 2 5 4 6 3 7
3 7 6 8 8 7
1.5. Can your group think of another method for calculating the answer?
____
____

____

____

____

____

2. Which of these methods do YOU prefer?

____

____

Why?

____

____

____

____

1.32.7 Assessment

Learning Outcome 1:The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.11: We know this when the learner uses a range of strategies to check solutions and judge the reasonableness of solutions.

Learning Outcome 2:The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 2.6: We know this when the learner determines, through discussion and comparison, the equivalence of different descriptions of the same relationship or rule presented:

1.33 To calculate by choosing methods that are appropriate for solving problem[33]

1.33.1 MATHEMATICS

1.33.2 Subtraction

1.33.3

1.33.4 EDUCATOR SECTION

1.33.5 Memorandum

1.33.6 LEANER SECTION

1.33.6.1 Content

1.33.6.1.1 Activity: To calculate by choosing methods that are appropriate for solving problem [LO 1.8.1]

1. You have already been exposed to a variety of methods for doing subtraction. Now you have to see whether you are able to use your accumulated knowledge meaningfully. Calculate the following, using whatever method you prefer:

1.1 721 435 – 342 668

____

____

____

---

[33] This content is available online at <http://cnx.org/content/m20080/1.1/>.

____

1.2 834 206 – 467 937

____

____

____

____

1.3 1 000 000 – 386 249

____

____

____

____

2. Check your answers by using a pocket calculator.

1.33.6.1.2 TIME FOR SELF-ASSESSMENT

Let's see how you are doing! Indicate how you feel about the different methods of subtraction. Colour the faces that reflect your feelings.

	Help!	Struggling	Almost coping	No problems
I can subtract by counting backwards (LO 1.8)				
I can use the rule of compensation for subtraction correctly (LO 1.8)				
I know how to subtract with negative numbers (LO 1.8)				
I can use the short method for subtraction (LO 1.8)				

Table 1.36

1.33.7 Assessment

Learning Outcome 1:The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.8: We know this when the learner estimates and calculates by selecting and using operations appropriate to solving problems that involve:

1.8.1: rounding off to the nearest 5, 10, 100 or 1 000.

1.34 To perform mental calculations[34]

1.34.1 MATHEMATICS

1.34.2 Subtraction

1.34.3

1.34.4 EDUCATOR SECTION

1.34.5 Memorandum

1.1 15
1.2 33
1.3 93
1.4 995
1.5 9 997
1.6 99 995
1.7 130
1.8 3 650
1.9 53
1.10 612 $\frac{1}{2}$
1.11 123
1.12 12
1.13 19
1.14 6
1.15 $\frac{1}{2}$
Puzzle out old code
1 286 1 335
- 539 - 934

1. 101

1.34.6 LEANER SECTION

1.34.6.1 Content

1.34.6.1.1 Activity: To perform mental calculations [LO 1.9.1]

1. During the previous activities you have worked with very large numbers. It is equally important to be able to subtract small numbers correctly. Let us see how you will manage the following mental calculations test! Work as quickly and accurately as possible:

1.1 $31 - 16 =$ ____
1.2 $52 - 19 =$____
1.3 $101 - 8 =$____
1.4 $1\,004 - 9 =$____
1.5 $10\,003 - 6 =$____
1.6 $100\,002 - 7 =$____
1.7 $240 - 50 - 60 =$____
1.8 $4\,000 - 350 =$____
1.9 $(530 \times 10) \div 100 =$____
1.10 Halve 1 225: ____

---

[34] This content is available online at <http://cnx.org/content/m20083/1.1/>.

1.11 Triple: ____

1.12 (11 × 12) - ________________________________ = 120

1.13 100 – (9 × 9) =____

1.14 (38 -____) ÷ 4 = 8

1.15 ____ × 850 = 425

15

Colour in: This time I have done GOOD AVERAGE POOR.

1.34.6.1.2 Decipher the code!

Each letter represents a digit. Can you discover the numbers?

ROAD		_________________		DEEP	_________________
- HIS		_________________		- HER	_________________
EWE		_________________		ROD	_________________

Table 1.37

Do you know that this kind of mathematics is called Alpha-mathematics?

1.34.7 Assessment

Learning Outcome 1:The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.9: We know this when the learner performs mental calculations involving:

1.9.1: addition and subtraction.

1.35 To solve problems in context[35]

1.35.1 MATHEMATICS

1.35.2 Subtraction

1.35.3

1.35.4 EDUCATOR SECTION

1.35.5 Memorandum

1.35.6 LEANER SECTION

1.35.6.1 Content

1.35.6.1.1 Activity: To solve problems in context [LO 1.6.1]

1.35.6.1.2 To use a range of techniques to perform calculations [LO 1.8.2]

Being observant, I'm sure that you will have seen that we deal with a lot of 'subtractions' in our daily lives! Consider the following carefully:

Here we have a list of things that you may also have at home.

1. Find two prices for each item in the local newspaper. Write down the highest price. Then calculate the difference between the two prices. (You may use your pocket calculator).

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[35] This content is available online at <http://cnx.org/content/m20084/1.1/>.

ITEM	PRICE 1	PRICE 2	DIFFERENCE
1.1 Computer	_______________	_______________	_______________
1.2 Microwave oven	_______________	_______________	_______________
1.3 Fridge	_______________	_______________	_______________
1.4 Colour TV	_______________	_______________	_______________
1.5 Iron	_______________	_______________	_______________

Table 1.38

2. How much will you save if you pay price 2 instead of price 1 for all the items?
____
____
____
____
____
3. Ask your partner to check your answers.

1.35.7 Assessment

Learning Outcome 1:The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.6: We know this when the learner solves problems in context including contexts that may be used to build awareness of other Learning Areas, as well as human rights, social, economic and environmental issues such as:

1.6.1: financial (including buying and selling, profit and loss, simple budgets, reading and interpreting accounts, and discount);

Assessment Standard 1.8: We know this when the learner estimates and calculates by selecting and using operations appropriate to solving problems that involve:

1.8.1: rounding off to the nearest 5, 10, 100 or 1 000

1.36 To solve problems in context[36]

1.36.1 MATHEMATICS

1.36.2 Subtraction

1.36.3

1.36.4 EDUCATOR SECTION

1.36.5 Memorandum

1.36.6 LEANER SECTION

1.36.6.1 Content

1.36.6.1.1 Activity 3.10 To solve problems in context [LO 1.6.1]

1.36.6.1.2 To use a range of techniques to perform calculations [LO 1.8.2]

1. CHALLENGE!

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[36] This content is available online at <http://cnx.org/content/m20086/1.1/>.

Choose any five items / articles that you are able to buy in a shop (they do not necessarily have to be groceries).

Write down what each item / article costs. You can cut out the pictures in the newspaper and paste it. Work neatly. Talk to your grandparents or any other older person about what the price was when they were children. Calculate how much more expensive it is now.

ITEM / ARTICLE	PRESENT PRICE	PRICE THEN	DIFFERENCE
a. ___________	______________ ____________	_____________	______________
a. ___________	______________ ____________	_____________	______________
a. ___________	______________ ____________	_____________	______________
a. ___________	______________ ____________	_____________	______________
a. ___________	______________ ____________	_____________	______________

Table 1.39

2. ANOTHER CHALLENGE!
Arrange a class discussion and find answers to the following:
2.1 What is a budget?
2.2 Must families have a budget?
2.3 Do YOU have a budget according to which you spend
your pocket money? If so, tell the class about it.

1.36.7 Assessment

Learning Outcome 1:The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.6: We know this when the learner solves problems in context including contexts that may be used to build awareness of other Learning Areas, as well as human rights, social, economic and environmental issues such as:

1.6.1: financial (including buying and selling, profit and loss, simple budgets, reading and interpreting accounts, and discount);

Assessment Standard 1.8: We know this when the learner estimates and calculates by selecting and using operations appropriate to solving problems that involve:

1.8.2: addition and subtraction of whole numbers.

1.37 To solve problems in context[37]

1.37.1 MATHEMATICS

1.37.2 Subtraction

1.37.3

1.37.4 EDUCATOR SECTION

1.37.5 Memorandum

1.37.6 LEANER SECTION

1.37.6.1 Content

1.37.6.1.1 Activity 3.11 To solve problems in context [LO 1.6.1]

1.37.6.1.2 To use a range of techniques to perform calculations [LO 1.8.2]

* * This is a task for your portfolio. You have been talking about a budget. Now answer the following questions. Work as neatly as you can, but first find out how this task is going to be assessed.

To find out at home:

1. Do your parents make use of a monthly budget?

2. Make a list of everything for which your parents need to budget each month.

____
____
____
____

3. What is the biggest monthly expense for your family?_______________________

4. What amount do your parents budget for groceries each month (approximately - you may round off the amount)____

5. What is the difference between this amount and the amount that your parents must pay monthly for your school fees?____

6. How much do you think a family of four (two adults and two teenage children) should budget for entertainment (cinema and eating out, etc.) each month?

Explain your answer.

____
____
____
____
____
____
____
____

7. Prepare a budget for YOURSELF for the next month (i.e. how much money you need and what for)

8. How much money will you have left to save if you received R300,00 pocket money per month?

____
____

1.37.6.1.3 ASSESSMENT: BUDGET

---

[37] This content is available online at <http://cnx.org/content/m20089/1.1/>.

Criteria	1	2	3	4
Completeness	Hardly any of the instructions have been carried out.	Half of the instructions have been carried out.	One or two instructions have not been completed.	All instructions have been completed.
Neatness and organisation	The work is untidy and unorganised.	The work is organised but difficult to read.	Neat and organised, legible.	Neat, clearly set out, clearly legible work.
Correctness of calculations	All the calculations are incorrect.	There are many mistakes.	A few mistakes occur.	All answers are correctly calculated.

Table 1.40

1.37.7 TEST

1. What numbers are needed to ensure that the total in each direction is 47?

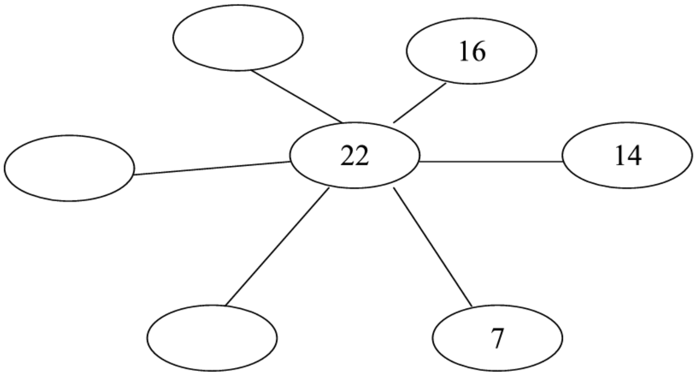

Figure 1.29

(3)
2. Provide the answers to the following without doing any written calculations:
2.1 975 – 325 = ______________________________________
2.2 1 050 – ____ = 900
2.3 103___________ – 102______________ = _____________ (3)
3. True or False?
3.1 The difference between 7 000 en 3 628 is 3 372 ______________________
3.2 25 less than 18 500 is 18 275 ___________________________ (2)
4. Ebrahim had to calculate the following: 130 000 – 27 864

$$\begin{array}{ccccccc} & & 2 & 10 & & & \\ & 1 & 3 & 0 & 0 & 0 & 0 \\ - & & 2 & 7 & 8 & 6 & 4 \\ \hline & 1 & 0 & 3 & 8 & 6 & 4 \end{array}$$

Figure 1.30

He did it as follows:

His calculation is incorrect. Circle each mistake. (2)

5. Correct Ebrahim's sum.

____

____

____

____

____(2)

6. Reduce 408 276 by 129 479.

____

____

____

____

____(4)

7. What will the subtrahend be if the minuend is 5 346 200 and the difference is 1 326 408?

____

____

____

____

____(4)

1.37.8 Assessment

Learning Outcome 1:The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.6: We know this when the learner solves problems in context including contexts that may be used to build awareness of other Learning Areas, as well as human rights, social, economic and environmental issues such as:

1.6.1: financial (including buying and selling, profit and loss, simple budgets, reading and interpreting accounts, and discount);

Assessment Standard 1.8: We know this when the learner estimates and calculates by selecting and using operations appropriate to solving problems that involve:

1.8.2: addition and subtraction of whole numbers.

Chapter 2

Term2

2.1 To perform mental calculations[1]

2.1.1 MATHEMATICS

2.1.2 Multiplication

2.1.3 EDUCATOR SECTION

2.1.4 Memorandum

1. Addition
   Multiplier

2.1.4.1 Product

2.1.4.2 Multiplicant

Factors
Multiples
1 x 3 786; 2 x 1 893; 6 x 631; 631 x 6
BRAIN TEASERS
3 786 3 786 x 1; 1 893 x 2
3 x 1 262; 1 262 x 3
1 x 8 742; 8 742 x 1; 6 x 1 457; 1 457 x 6
8 742 2 x 4 371; 4 371 x 2
3 x 2 914; 2 914 x 3

2.1.5 LEANER SECTION

2.1.6 Content

2.1.6.1 Activity:To perform mental calculations [LO 1.9.2]

1. How well do you know your 12 × table? Count in 12's and colour each answer in green.
   If you do this correctly you will find the answer to the following:
   Multiplication is actually repeated ____

---

[1] This content is available online at <http://cnx.org/content/m20929/1.1/>.

12	14	34	41	68	70	82	100	109	124	131	142	150	197
A	W	V	F	H	O	B	G	X	H	B	E	T	S
22	24	36	46	64	73	96	110	112	126	135	146	151	180
B	D	D	T	I	U	N	A	Z	R	D	O	R	E
30	26	32	48	62	71	84	115	119	120	137	144	154	168
M	Y	R	I	E	J	O	I	C	T	K	E	A	V
41	28	40	50	60	72	101	117	121	129	132	148	156	165
S	K	T	B	T	I	Y	D	H	S	W	F	L	F

Table 2.1

- Can you find any more multiples of 12? Colour them in blue.

What word does your answer spell? ____

2. LET US REVISE!

Fill in the missing answer:

In 24 x 17 = 408, we call:

17 the____

408 the____

24 the____

24 and 17 ____ of 408

408 a ____ of 17

2.1.7 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.9: We know this when the learner performs mental calculations involving:

1.9.2: multiplication of whole numbers to at least 12 x 12.

2.2 To recognise, classify and represent numbers[2]

2.2.1 MATHEMATICS

2.2.2 Multiplication

2.2.3 EDUCATOR SECTION

2.2.4 Memorandum

1.4 9 12 888

15

18

1 476 195 361

No matter in which order you multiply – answer remains the same.

---

[2] This content is available online at <http://cnx.org/content/m20930/1.1/>.

2.2.5 LEANER SECTION

2.2.6 Content

2.2.6.1 Activity: To recognise, classify and represent numbers [LO 1.3.6]

1. MORE REVISION!
How many factors can you write down for each product?

E.g. 12	12 × 1		1.1	______________________
	2 × 6			______________________
	3 × 4			______________________
	4 × 3	42		______________________
	6 × 2			______________________
	1 × 12			______________________
				______________________
				______________________

Table 2.2

1.2	______________________		1.3	______________________
	______________________			______________________
	______________________			______________________
64	______________________	72		______________________
	______________________			______________________
	______________________			______________________
	______________________			______________________
	______________________			______________________

Table 2.3

BRAIN-TEASER!
Find the following factors (you may use your calculator, if necessary):
a) 3 786
____
____
____
b) 8 742
____
____
____
1.4 Compete with a friend to see whose answers are written down first:
9 x 7 = 7 x____________________
716 x 18 = ____________________
____________________ v 16 = 16 x 15
18 x 716 = 12 888

324 x ____________________ = 18 x 324
563 v 347 = 195 361
1 476 x 326 = 326 x____________________
347 x 536 = ____________________

- What do you realise?

DID YOU KNOW?
We call the above the **COMMUTATIVE PROPERTY** of multiplication.
DID YOU ALSO KNOW?
The **ASSOCIATIVE PROPERTY** of multiplication looks like this:
(6 x 5) x 2 = 6 x (2 x 5)
2 x (3 x 4) = (2 x 3) x 4
Thus, it makes no difference how we **GROUP** the numbers because the answer stays the same.

2.2.7 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.3: We know this when the learner recognises and represents the following numbers in order to describe and compare them:
1.3.6: multiples and factors of at least any 2-digit and 3-digit whole number.

2.3 To recognise, describe and use the properties of whole numbers[3]

2.3.1 MATHEMATICS

2.3.2 Multiplication

2.3.3

2.3.4 EDUCATOR SECTION

Memorandum
1. 17

1. x 19

63
72
Something else to know.
50

1. + 15 = 50

2. (a) 20 + 7
(b) 500 + 30
500 30 94

---

[3] This content is available online at <http://cnx.org/content/m20932/1.1/>.

2.3.5 BRAIN TEASERS

[U+F0D6]	X	[U+F0D6]	X
[U+F0D6]	X	[U+F0D6]	X
[U+F0D6]	X	X	[U+F0D6]

Table 2.4

1.4 Dolphin

2.3.6 LEANER SECTION

2.3.7 Content

2.3.7.1 Activity: To recognise, describe and use the properties of whole numbers [LO 1.12.2]

1. Take another look at the properties of multiplication that you have studied. Now complete the following:

17 x (15 x 13) = (____________________________x 15) x 13

(246 x 38) x 19 = 246 x (______________x ______________)

_________________________ x (526 x 59) = (63 x 59) x 526

(349 x _________________________) x 68 = 72 x (349 x 68)

SOMETHING MORE TO KNOW!

The **DISTRIBUTIVE PROPERTY** of multiplication makes it much easier to calculate the product.

Calculate the answer to the following:

(7 + 3) x 5 = ____________________________________

(7 x 5) + (3 x 5) = ______________ + ______________ = ______________

Thus: (7 + 3) x 5 = (7 x 5) + (3 x 5)

2. Work together with a friend and fill in the missing answers:

a) 68 x 27 = 68 x (________________ + ___________________)

b) 94 x 536 = 94 x (________________ + ______________ + 6)

= (94 x _________________) + (94 x _________________) + (_________________x 6)

BRAIN-TEASER!

4 Can you complete the following table by filling in a tick (P) or a cross (O)?

Property	can be applied to **multiplication**	can be applied to**division**	can be applied to **addition**	can be applied to **subtraction**
Commutative	____________	________	________	________
Associative	____________	________	________	________
Distributive	____________	________	________	________

Table 2.5

2.3.7.1.1 TIME FOR SELF-ASSESSMENT

• Tick the applicable block:	1	2	3	4
I know the 12x- table. (LO 1.9)	____	____	_____	_____
I know the terminology *(product, multiple, factors, multiplier*, etc.) and can use it properly. (LO 1.12)	____	____	_____	_____
I can determine factors of numbers correctly. (LO 1.3)	____	____	_____	_____
I can apply the commutative property of multiplication. (LO 1.12)	____	____	_____	_____
I can apply the associative property of multiplication. (LO 1.12)	____	____	_____	_____
I can apply the distributive property of multiplication. (LO 1.12)	____	____	_____	_____

Table 2.6

2.3.8 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.12: We know this when the learner recognises, describes and uses:
1.12.2: the commutative, associative and distributive properties with whole numbers.

2.4 To perform mental calculations[4]

2.4.1 MATHEMATICS

2.4.2 Multiplication

2.4.3

2.4.4 EDUCATOR SECTION

Memorandum

2.4.5 LEANER SECTION

2.4.5.1 Content

2.4.5.1.1 Activity: To perform mental calculations [LO 1.9.2]

1. Let us see if you still know your other tables. Something or someone is hidden away. Find the answers of the following and colour the blocks in.

When you have discovered what it is, write the answer down:

____

____

____

____

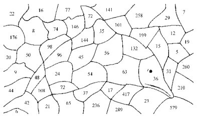

Figure 2.1

1.1 9 x 4
1.2 6 x 7
1.3 5 x 9
1.4 12 x 6
1.5 7 x 9
1.6 3 x 8
1.7 6 x 9
1.8 11 x 12
1.9 8 x 7
1.10 12 x 8
1.11 7 x 5
1.12 6 x 8
1.13 12 x 12
1.14 9 x 8
1.15 12 x 9
15

---

[4] This content is available online at <http://cnx.org/content/m20936/1.1/>.

DO YOU STILL REMEMBER?
10 = 10 x 1
100 = 10 x 10
1 000 = 10 x 10 x 10
10 000 = 10 x 10 x 10 x 10
100 000 = 10 x 10 x 10 x 10 x 10
1 000 000 = 10 x 10 x 10 x 10 x 10 x 10
DO YOU ALSO REMEMBER?
We can write the number in a shorter way by using the POWERS OF TEN.
10 = 101 (10 to the power of 1)
100 = 102 (10 to the power of 2)
1 000 = 103
10 000 = 104
100 000 = 105
1 000 000 = 106

2.4.6 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.9: We know this when the learner performs mental calculations involving:
1.9.2: multiplication of whole numbers to at least 12 x 12.

2.5 To determine output values for given input values[5]

2.5.1 MATHEMATICS

2.5.2 Multiplication

2.5.3 EDUCATOR SECTION

Memorandum

1.1	7				700
	32		× **10 2**		3 200
	236				
	986				98 600
	4614				461 400

Table 2.7

1.2	6				6 000

continued on next page

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[5] This content is available online at <http://cnx.org/content/m20937/1.1/>.

	27		× **10 3**		27 000
	53				53 000
	719				719 000
	894				894 000

Table 2.8

1.3	4		**10 3**		400 000
	19				1 900 000
	236				23 600 000

Table 2.9

2. 2.1 20 000 + 9 000 = 29 000
2.2 160 000 + 1 200 = 158 800
2.3 700 000 = 4 000 000 = 4 700 000
2.4 8 000 000 + 160 000 = 7 840 000

2.5.4 LEANER SECTION

2.5.5 Content

2.5.5.1 Activity: To determine output values for given input values [LO 2.3.2]

1. Let us see whether you are able to apply your knowledge of powers of 10 correctly. Complete the following flow diagrams:

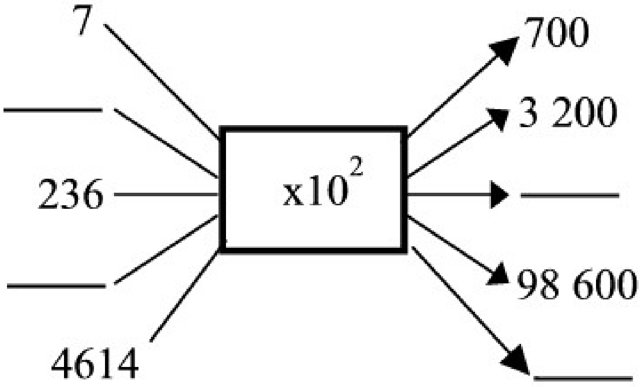

Figure 2.2

1.1

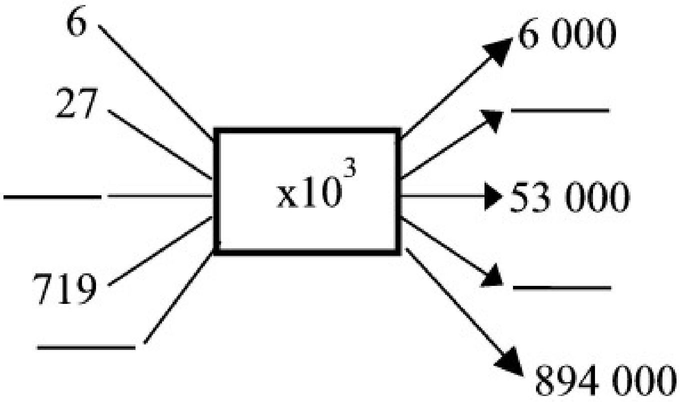

Figure 2.3

1.2

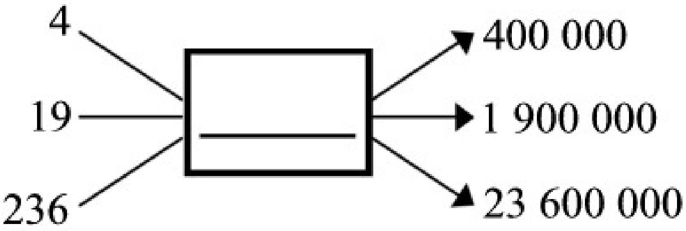

Figure 2.4

1.3

2. Work together with a friend and calculate:

2.1 (2 x 10^4) + (9 x 10^3) = _____________ + _____________ = _____________
2.2 (16 x 10^4) + (12 x 10^2) = ____________ + _____________ = _____________
2.3 (7 x 10^5) + (4 x 10^6) = _____________ + _____________ = _____________
2.4 (8 x 10^6) + (16 x 10^4) = _____________ + _____________ = _____________

3. Check your answers with a calculator.

CAN YOU STILL REMEMBER?

Explain to a friend how you can programme a calculator to multiply in powers of 10.

2.5.6 Assessment

Learning Outcome 2: The learner will be able to recognise, describe and represent patterns and relationships, as well as to solve problems using algebraic language and skills.

Assessment Standard 2.3: We know this when the learner determines output values for given input values, or input values for given output values, using:

2.3.2: flow diagrams.

2.6 To use a range of techniques to perform calculations[6]

2.6.1 MATHEMATICS

2.6.2 Multiplication

2.6.3 EDUCATOR SECTION

2.6.4 Memorandum

1. 150; 1 500; 15 000; 150 000; 1 500 000; 15 000 000; 1.500 000 E
   2. Screen too small for answer.
   3. Error
   4. 4.1 3

- 5
- 7

5.1

50
125
200
300

Table 2.10

5.2

200		50
500		125
800		200
1 200		300

Table 2.11

6. Answer remains the same.

---

[6] This content is available online at <http://cnx.org/content/m20953/1.1/>.

2.6.5 LEANER SECTION

2.6.6 Content

2.6.6.1 Activity: To use a range of techniques to perform calculations [LO 1.10.5]

2.6.6.2 To determine output values for given input values [LO 2.3.1, LO 2.3.3]

Were you able to explain how to programme a pocket calculator? If not, ask a friend to help you. Answer the following questions if you understand how to do the programming.

1. Key in: 10 x 15 = = = =
Write down your answers each time: ____
____
2. Why does your calculator eventually say 15 000 000 E? ___________________
____
3. What does die E stand for? ____
4. Complete the following:
4.1 346 x 1 000 = 346 x 10o ______________________________________
4.2 346 x 100 000 = 346 x 10o _____________________________________
4.2 346 x 10 000 000 = 346 x 10o __________________________________
5. Complete the following tables:

5.1	1 × 25	25
	2 × 25	_____
	5 × 25	_____
	8 × 25	_____
	12 × 25	_____

Table 2.12

5.2	1 × 100	100	[U+F0B8] 4	25
	2 × 100	_____	[U+F0B8] 4	_____
	5 × 100	_____	[U+F0B8] 4	_____
	8 × 100	_____	[U+F0B8] 4	_____
	12 × 100	_____	[U+F0B8] 4	_____

Table 2.13

6. What do you realise when you look at the answers of these two tables?
____
____
____
____

2.6.7 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.10: We know this when the learner uses a range of techniques to perform written and mental calculations with whole numbers including:

1.10.5: using a calculator.

Learning Outcome 2: The learner will be able to recognise, describe and represent patterns and relationships, as well as to solve problems using algebraic language and skills.

Assessment Standard 2.3: We know this when the learner determines output values for given input values, or input values for given output values, using:

2.3.1: verbal descriptions.

2.7 To use a range of techniques to perform calculations[7]

2.7.1 MATHEMATICS

2.7.2 Multiplication

2.7.3 EDUCATOR SECTION

2.7.4 Memorandum

1.1 9 x 25 ÷9 x 100) ÷ 4

1.2 368 x 25 ÷368 x 100) ÷ 4

1.3 16 x 25 ÷16 x 100) ÷ 4

2. 2.1 ÷324 x 100) ÷ 4

32 400 ÷ 4

8 100

2.2 ÷1 436 x 100) ÷ 4

143 600 ÷ 4

35 900

2.3 ÷26 844 x 100) ÷ 4

2 684 400 ÷ 4

671 100

2.7.5 BRAIN TEASERS

yes

÷1 436 ÷ 4) x 100

359 x 100

35 900

3.1

	375
	625
	1 125

Table 2.14

3.2

---

[7] This content is available online at <http://cnx.org/content/m20969/1.1/>.

	3 000	_ _ _ _ _ _ _ _	375
	5 000	_ _ _ _ _ _ _ _	625
	9 000	_ _ _ _ _ _ _ _	1 125

Table 2.15

4. Answer the same.
5. 1 000
8
divide
8
1 000
multiplication
6.1 36 x 1 000 1 056 000 ÷ 8
36 000 132 000
6.2 132 x 1 000 ÷1 056 x 1 000 ÷ 8
132 000 132 000

2.7.6 BRAIN TEASERS

x 1 000 [U+F0B8] 2 / x 5 x 100 / 2 x 1 000

2.7.7 LEANER SECTION

2.7.8 Content

2.7.8.1 Activity: To use a range of techniques to perform calculations [LO 1.10.3]

2.7.8.2 To determine output values for given input values [LO 2.3.3]

It is very important to develop strategies for arriving at answers quickly to make life easier in Grade 6. Let us take a look at some bright ideas to use when we do multiplication!

REMEMBER!
When you multiply by 25 you can first multiply by 100 and
then divide by 4!
1. Can you balance the following scales by filling in the correct number?
1.1

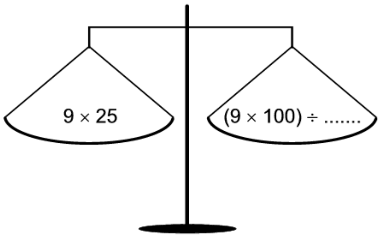

Figure 2.5

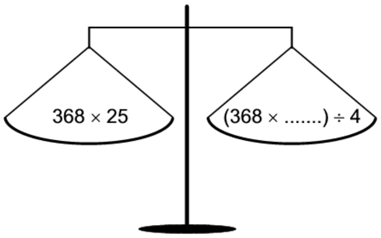

Figure 2.6

1.2
1.3

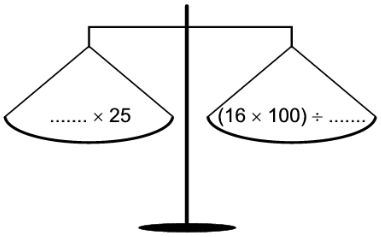

Figure 2.7

2. Use the above method to calculate:
2.1 324 x 25 =
_ _
_ _
_ _
2.2 1 436 x 25 =
_ _
_ _
_ _
2.3 26 844 x 25 =
_ _
_ _
_ _
BRAIN-TEASER!
Can I also first divide by 4 and then multiply by 100? _
Prove your answer!
1 436 x 25 =_ _
=_ _
=_ _
3. Look carefully at the following example and then complete the tables:

3.1	1 × 125	125
	3 × 125	_____
	5 × 125	_____
	9 × 125	_____

Table 2.16

3.2	1 × 1 000	1 000	÷ 8	25
	3 × 1 000	_____	÷ 8	_____
	5 × 1 000	_____	[U+F0B8] 8	_____
	9 × 1 000	_____	[U+F0B8] 4	_____

Table 2.17

4. Compare the answers in the tables. What do you realise?
____
____
____
5. Complete the following:
REMEMBER:
If I have to multiply by 125 I can first multiply by ______________________________
and then ______________________ the answer I get by ______________________________
OR I can first divide the number by____________________________________ and then
______________________________ the answer by _______________________________
6. See if you can apply this method!
6.1 288 x 125 = ÷288 [U+F0B8] 8) x 1 000
= _________________________
= _________________________
or
288 x 125 = ÷288 x 1 000) ÷ 8
= _________________________
= _________________________
6.2 1 056 x 125 = ÷1 056 ÷ 8) x 1 000 or _______________________
= _________________________
= _________________________
BRAIN-TEASER!
WITHOUT using a calculator, how would you multiply a number by 500 in two seconds?

2.7.9 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.10: We know this when the learner uses a range of techniques to perform written and mental calculations with whole numbers including:

1.10.3: building up and breaking down numbers.

Learning Outcome 2: The learner will be able to recognise, describe and represent patterns and relationships, as well as to solve problems using algebraic language and skills.

Assessment Standard 2.3: We know this when the learner determines output values for given input values, or input values for given output values, using:

2.3.3: tables.

2.8 To perform mental calculations[8]

2.8.1 MATHEMATICS

2.8.2 Multiplication

2.8.3 EDUCATOR SECTION

2.8.4 Memorandum

1.1 6
1.2 96
1.3 150
1.4 500
1.5 12
1.6 42
1.7 5
1.8 1 000 000
1.9 9 900
1.10 63 000
1.11 524
1.12 66
1.13 100
1.14 578
1.15 768$\frac{1}{2}$ / 768,5

2.8.5 LEANER SECTION

2.8.6 Content

2.8.6.1 Activity: To perform mental calculations [LO 1.9.2]

If you have attended well during the previous activities, the following mental calculation test should be child's play! Let us see how well you manage.

1. Complete the following:
1.1 _______________________ x 9 = 54
1.2 _______________________ ÷ 8 = 12
1.3 6 x 25 = _______________________
1.4 4 x 125 = _______________________
1.5 6 x _______________________ = 72
1.5 _______________________ ÷ 6 = 7
1.6 45 ÷ _______________________ = 9
1.7 106 = _______________________
1.8 104 - 102 = _______________________
1.9 63 x 103 = _______________________
1.10 (5 x 102) + (6 x 4) = _______________________
1.11 (13 x 6) – (4 x 3) = _______________________

---

[8] This content is available online at <http://cnx.org/content/m20972/1.1/>.

1.12 105 ÷ 103 = _____________________
1.13 Double: 289: _____________________
1.14 Halve: 1 537: _____________________

- Colour in the applicable block:

I had	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	correct!

Table 2.18

2.8.7 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.9: We know this when the learner performs mental calculations involving:

1.9.2: multiplication of whole numbers to at least 12 x 12.

2.9 To solve problems in context[9]

2.9.1 MATHEMATICS

2.9.2 Multiplication

2.9.3 EDUCATOR SECTION

2.9.4 Memorandum

2.9.5 LEANER SECTION

2.9.6 Content

2.9.6.1 Activity: To solve problems in context [LO 1.6]

2.9.6.2 To use a range of techniques to perform calculations [LO 1.10.1, LO 1.10.5]

1. Divide into groups of three. Ask your educator for the required sheets of paper and calculate the following answers WITHOUT making use of a pocket calculator:

1.1 The Johnny family's telephone account comes to approximately R376 each month. More or less how much will they have to pay for a year's use of the telephone?

1.2 Mr Naidoo drives 795 km each month for his work. What is the distance that he covers in a year and a half?

1.3 The Grade 7s are going on a tour and each learner has to pay R499. What is the total amount that the 78 learners will have to pay?

1.4 The "Ride Safely" taxi group transports passengers to a soccer match in Johannesburg, at R245 per passenger. What is the total amount that will be paid if 837 spectators make use of their service?

1.5 An elephant calf weighs 932 kg. How much will 348 elephant calves weigh?

2. Check your answers with the help of a pocket calculator.

3. Explain how you calculated your answers to the rest of the class.

4. Compare the different methods. How do they differ?

---

[9] This content is available online at <http://cnx.org/content/m20954/1.1/>.

2.9.6.2.1 GROUP ASSESSMENT

Evaluate your work on a scale of 1 – 4 by circling the appropriate number.

1 = needs attention
2 = fairly good
3 = very good
4 = outstanding

2.9.6.2.2 CRITERIA

All the members of the group participated in the activities.	1	2	3	4
Members of the group listened to one another.	1	2	3	4
Members of the group helped and encouraged each other.	1	2	3	4
Group members adhered to the instructions.	1	2	3	4
Each one had a chance to talk.	1	2	3	4
The group's work was done neatly.	1	2	3	4
The answers were calculated correctly.	1	2	3	4

Table 2.19

2.9.7 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.6: We know this when the learner solves problems in context including contexts that may be used to build awareness of other Learning Areas, as well as human rights, social, economic and environmental issues such as:

Assessment Standard 1.10: We know this when the learner uses a range of techniques to perform written and mental calculations with whole numbers including:

1.10.1: multiplying in columns;
1.10.5: using a calculator.

2.10 To calculate with the help of selected operations appropriate to solving the problem[10]

2.10.1 MATHEMATICS

2.10.2 Multiplication

2.10.3 EDUCATOR SECTION

2.10.4 Memorandum

2.10.5 LEANER SECTION

2.10.6 Content

2.10.6.1 Activity: To calculate with the help of selected operations appropriate to solving the problem [LO 1.8.4]

1. Now use any method and calculate:

- 654 x 78

____
____
____
____
____
____

1.2 426 x 387

____
____
____
____
____
____

1.3 729 x 345

____
____
____
____
____
____
____
____
____

TIME FOR SELF-ASSESSMENT

It is important for us to know how you feel about the section of the work that we have completed. Give an indication of how well you understand it by reading the criteria and marking the appropriate blocks with a tick.

---

[10] This content is available online at <http://cnx.org/content/m20957/1.1/>.

	GO	WAIT	STOP
I understand the powers of 10 and can do calculations with them. (LO 1.10)	_ _ _ _ _ _ _	_ _ _ _ _ _ _	_ _ _ _ _ _ _
I can programme my calculator to multiply in powers of 10. (LO 1.10)	_ _ _ _ _ _ _	_ _ _ _ _ _ _	_ _ _ _ _ _ _
I can use an alternative method instead of multiplying by 25 (LO 1.10)	_ _ _ _ _ _ _	_ _ _ _ _ _ _	_ _ _ _ _ _ _
I can multiply by 125 without using 125 as the multiplier. (LO 1.10)	_ _ _ _ _ _ _	_ _ _ _ _ _ _	_ _ _ _ _ _ _
I know my tables. (LO 1.9)	_ _ _ _ _ _ _	_ _ _ _ _ _ _	_ _ _ _ _ _ _
I understand all the methods of multiplication shown in this module. (LO 1.11 and LO 2.6)	_ _ _ _ _ _ _	_ _ _ _ _ _ _	_ _ _ _ _ _ _
I can calculate the product of any 2 numbers without using my calculator. (LO 1.8)	_ _ _ _ _ _ _	_ _ _ _ _ _ _	_ _ _ _ _ _ _

Table 2.20

2.10.6.1.1 BRAIN-TEASER!

In Scotland, in 1617, Lord John Napier used the following table for multiplication:

He calculated 456 x 8 in this manner:

His answer was 3 648.

1. Work with a friend. Can the two of you work out his method?

2. Use the table and calculate:

2.1 698 x 5

= ....

2.2 687 x 9

= ....

2.3 How would you calculate 6 437 × 382 by using the table??

= ....

2.4 Give your friend a sum to do by using the table. Write the sum, calculation and the answer below.

2.5 Check your friend's sum.

2.10.7 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.11: We know this when the learner uses a range of strategies to check solutions and judge the reasonableness of solutions.

Learning Outcome 2: The learner will be able to recognise, describe and represent patterns and relationships, as well as to solve problems using algebraic language and skills.

Assessment Standard 2.6: We know this when the learner determines, through discussion and comparison, the equivalence of different descriptions of the same relationship or rule presented:

2.6.3: by number sentences.

2.11 To calculate with the use of selected operations that are appropriate for solving the problem[11]

2.11.1 MATHEMATICS

2.11.2 Multiplication

2.11.3 EDUCATOR SECTION

2.11.4 Memorandum

2.11.5 LEANER SECTION

2.11.6 Content

2.11.6.1 Activity: To calculate with the use of selected operations that are appropriate for solving the problem [LO 1.6.1]

CHALLENGE!!

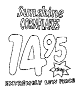

Figure 2.8

Mrs Bengu had to buy breakfast cereal for a camp. After doing thorough research to find the cheapest product, she settled for this cereal, which sold at R14,95 per box.

1. How much did Mrs Bengu have to pay for 38 boxes? (Use your calculator).

____

2. How much change did she receive if she paid with three R200 notes?

____

2.11.7 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

---

[11] This content is available online at <http://cnx.org/content/m20958/1.1/>.

Assessment Standard 1.6: We know this when the learner solves problems in context including contexts that may be used to build awareness of other Learning Areas, as well as human rights, social, economic and environmental issues such as:

1.6.1: financial (including buying and selling, profit and loss, simple budgets, reading and interpreting accounts, and discount).

2.12 To ask simple questions and identify relevant data[12]

2.12.1 MATHEMATICS

2.12.2 Multiplication

2.12.3 EDUCATOR SECTION

2.12.4 Memorandum

2.12.5

2.12.6

2.12.7 LEANER SECTION

2.12.8 Content

2.12.8.1 Activity: To ask simple questions and identify relevant data [LO 5.1]

2.12.8.2 To collect data and answer questions [LO 5.2]

2.12.8.3 To organise and record data [LO 5.4]

2.12.8.4 To investigate data to describe the main tendency [LO 5.5]

2.12.8.5 To draw graphs [LO 5.6.1/2]

2.12.8.6 To read and interpret data critically [LO 5.7.2]

** This task is for your portfolio.

Do it as neatly as you can, but first take note of how it will be assessed.

1. Let us look at your classmates' habits when it comes to eating breakfast. Find out what the other learners in your class have for breakfast.

2. Use the block below as a record sheet for recording your information:

Example:

GRADE 6	
BREAKFAST	NO. OF LEARNERS
Warm porridge	2
Bread	1
Rusks	6
Cereals	3
Fruit	8

Table 2.21

---

[12] This content is available online at <http://cnx.org/content/m20959/1.1/>.

______________________________	______________________________
______________________________	______________________________
______________________________	______________________________
______________________________	______________________________
______________________________	______________________________
______________________________	______________________________
______________________________	______________________________
______________________________	______________________________

Table 2.22

3. You have already got to know a variety of graphs. (Do you remember any?) See whether you are able to record the information from the record sheet in a graph.

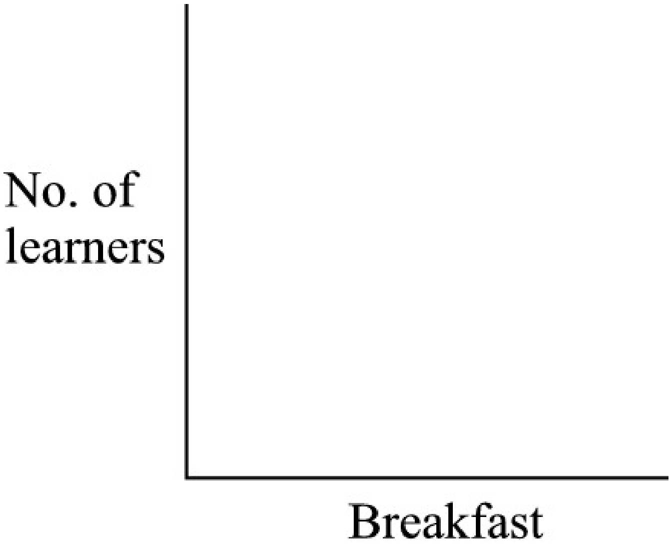

Figure 2.9

Breakfast

4. Find out WHICH breakfast food is the most popular among your class mates.

____

5. Find out the price per box/container of this item and calculate what you would have to pay if you bought ONE box for EACH learner in your class.

____

____

____

____

6. Write a short report concerning your class mates' breakfast choices and habits.

____

____

____

____

____

____

ASSESSMENT: BREAKFAST DATA

CRITERIA	1	2	3	4
Neatness and organisation	The work is untidy and incomplete.	The work is organised, but is difficult to read.	The work is neat and organised and reads easily.	Neat, clearly set out work; easy to read.
Graph	The learner has not made any effort.	Most of the information is indicated incorrectly.	One or two mistakes occur.	The graph is correct and neat.
Degree of completeness	No research was undertaken.Some questions remain unanswered.	Much of the required information is missing.	Only very few questions remain unanswered.	The task is completed fully.
Correctness of calculations	All the answers are calculated incorrectly.	Many mistakes occur.	Few mistakes were made.	All the answers are correctly calculated.

Table 2.23

2.12.9 Assessment

Learning Outcome 5: The learner will be able to collect, summarise, display and critically analyse data in order to draw conclusions and make predictions, and to interpret and determine chance variation.

Assessment Standard 5.1: We know this when the learner poses simple questions about own school and family environment, and identifies appropriate data sources in order to address human rights, social, political, cultural, environmental and economic issues in that environment;

Assessment Standard 5.2: We know this when the learner uses simple data collection sheets (requiring tallies) and simple questionnaires (with yes/no type responses) in order to collect data (alone and/or as a member of a group or team) to answer questions posed by the teacher, class and self;

Assessment Standard 5.4: We know this when the learner organises and records data using tallies and tables;

Assessment Standard 5.5: We know this when the learner examines ungrouped numerical data to determine the most frequently occurring score (mode) and the midpoint (median) of the data set in order to describe central tendencies;

Assessment Standard 5.6: We know this when the learner draws a variety of graphs by hand/technology to display and interpret data (grouped and ungrouped):

5.6.1: pictographs with a many-one correspondence and appropriate keys;

5.6.2: bar graphs and double bar graphs;

Assessment Standard 5.7: We know this when the learner critically reads and interprets data presented in a variety of ways (including own representations, representations in the media – words, graphs, pie graphs) to draw conclusions and make predictions sensitive to the role of:

5.7.2: categories within the data (e.g. age, gender, race).

TEST

1. Fill in the missing words:

In 17 x 240 = 4 080 we call:
1.1 408 the ____
1.2 17 the ____

- 4 080 a ____ of 240.

(3)
2. Write down all the factors of 36:
____
____
(2)
3. Draw a circle around the mistake(s) in the following sum:
h = 953 x 18
953
18
7 634
9630
17 264
(3)
4. Calculate the following. Show all your calculations:
4.1 m = 239 x 37
____
____
____
____
____
____
____
(3)
4.2 A farmer transports 238 crates with 85 apples in each crate to the market. How many apples were delivered to the market?
____
____
____
____
____
____
____
(4)

2.13 To perform mental calculations[13]

2.13.1 MATHEMATICS

2.13.2 Division

2.13.3 EDUCATOR SECTION

2.13.4 Memorandum

1. inverse

---

[13] This content is available online at <http://cnx.org/content/m20974/1.1/>.

2. dividend; kwotient; divider
3. remainder
4. one
5. naught
6. halve

2.13.5

2.13.6 LEANER SECTION

2.13.7 Content

2.13.7.1 Activity: To perform mental calculations [LO 1.9.3]

For a long time you have known how important it is to be able to do mental calculations. By now you probably also know your multiplication tables very well! But how well do you know division tables? Decode the following as quickly as you can:

Write your answer in the empty blocks underneath the sums .

A	D	I	E	C	Y	L	M	O	N	V	N	U	F
7	12	5	4	8	6	10	3	2	14	11	9	13	1

Table 2.24

LET US REVISE!

The answers to the following questions are hidden in the word search. Look for the answers with a friend and then colour in neatly.

N	O	U	G	H	T	L	Y	Q
K	A	S	I	O	D	Y	R	U
W	E	S	N	P	I	H	E	O
H	A	L	V	E	V	R	M	T
B	F	P	E	O	I	G	A	I
T	J	A	R	F	D	V	I	E
I	R	E	S	D	E	H	N	N
M	W	H	E	G	N	U	D	T
O	N	E	J	R	D	S	E	Q
C	D	I	V	I	D	E	R	E

Table 2.25

1. Division is the ____ of multiplication.

2. In 3 860 ÷ 20 = 193 is

3 680 the ____

193 the ____ and

20 the ____

3. If a number can't be divided precisely into a dividend, we call the amount that is left over, the ____

4. Any number that is divided by____ remains unchanged.
5. Division by____ is undefined.
6. If we ____________________________________ a number, we divide it by 2.

2.13.8 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.9: We know this when the learner performs mental calculations involving:
1.9.3: division with small numbers.

2.14 To recognise, describe and use[14]

2.14.1 MATHEMATICS

2.14.2 Division

2.14.3 EDUCATOR SECTION

Memorandum

1.1 last 0 falls away
each number moves 1 place to the right
1.2 last 2 naughts falls away
each number moves 2 places to the right
1.3 last 3 noughts falls away
each number moves 3 places to the right
1.4 last 4 noughts falls away
each number moves 4 places to the right
7.

7.1 38	380	3 800	38 000
7.2 12	120	1 200	12 000
7.3 9	90	900	9 000
7.4 4	40	400	4 000
7.5 $\frac{1}{2}$ / 0,5	5	50	500

Table 2.26

---

[14] This content is available online at <http://cnx.org/content/m20975/1.1/>.

2.14.4

2.14.5

2.14.6 LEANER SECTION

2.14.7 Content

2.14.7.1 Activity: To recognise, describe and use [LO 1.12.1]

As with multiplication, there are particular rules for division by multiples of 10, that enable you to calculate answers in a flash – without using pencil and paper! You have to form groups of three learners for the following activity.

1. See if you can formulate rules for the following:
2. Division by 10: ____
____
____
3. Division by 100: ____
____
____
4. Division by 1 000: ____
____
____
5. Division by 10 000: ____
____
____
6. Compare your answers with those of the class!
7. How quickly can YOU write down the answers to the following without using a calculator?

	NUMBER	÷ 10 000	÷ 1 000	÷ 100	÷ 10
E.g.	560 000	56	560	5 600	56 000
7.1	380 000	....	....	....	....
7.2	120 000	....	....	....	....
7.3	90 000	....	....	....	....
7.4	40 000	....	....	....	....
7.5	5 000	....	....	....	....

Table 2.27

2.14.8 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.12: We know this when the learner recognises, describes and uses:

1.12.1: divisibility rules for 2, 5, 10, 100 and 1 000.

2.15 To use divisibility rules[15]

2.15.1 MATHEMATICS

2.15.2 Multiplication

2.3 1.1 12
1.2 6
1.3 9
1.4 8
1.5 5
1.6 12
1.7 45
1.8 50
1.9 900
1.10 500
1.11 580
1.12 100
1.13 2
1.14 12,5 / $12\frac{1}{2}$
1.15 6

2.15.3 LEANER SECTION

2.15.3.1 Content

2.15.3.2 Activity: To use divisibility rules [LO 1.12.1]

Now you can test your skill in division and use the new knowledge that you have gained effectively. Let us see how you cope with the following mental calculation test. Write down answers only, as quickly as you can.

1.1 72 ÷ 6 = _____________________
1.2 54 ÷ 9 = _____________________
1.3 63 ÷ 7 = _____________________
1.4 48 ÷ _____________________ = 6
1.5 35 ÷ _____________________ = 7
1.6 108 ÷ _____________________ = 9
1.7 _____________________ ÷ 5 = 9
1.8 4 500 ÷ _____________________ = 90
1.9 45 000 ÷ 50 = _____________________
1.10 45 000 ÷ _____________________ = 90
1.11 5 800 ÷ 10 = _____________________
1.12 8 900 ÷ _____________________ = 89
1.13 2 420 ÷ 20 = (2 420 ÷ 10) ÷ _____________________
1.14 A half ´ 25 = _____________________
1.15 (30 ÷ 5) = (36 ÷ _____________________)
15

Fill in: I got _____________________ correct!

TIME FOR SELF-ASSESSMENT!

How well do you know the work we have done up to now? Indicate this by marking the appropriate block:

---

[15] This content is available online at <http://cnx.org/content/m20980/1.1/>.

- Tick the applicable block	Not at all	Very uncertain	Somewhat uncertain	Very well
I know my ÷ tables. (LO 1.9)	____	____	____	____
I knew most of the revision questions. (LO 1.12)	____	____	____	____
I can formulate rules for division by powers of 10 (10 ; 100 ; 1 000 ; 10 000) (LO 1.12)	____	____	____	____
I can divide correctly by 1 000 (LO 1.12)	____	____	____	____
I can divide correctly by 10 000 (LO 1.12)	____	____	____	____
It is easy for me to divide by 10 and 100 (LO 1.12)	____	____	____	____

Table 2.28

BRAIN-TEASER!

Francois has a bag of marbles. If he divides them into groups of 4, 2are left over. If he divides them into groups of 5, 1 is left over. How many marbles can there be in his bag? Could you write down 5 possible answers in the bag?

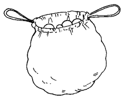

Figure 2.10

2.15.4 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.12: We know this when the learner recognises, describes and uses:

1.12.1: divisibility rules for 2, 5, 10, 100 and 1 000.

2.16 To use a range of techniques for performing calculations[16]

2.16.1 MATHEMATICS

2.16.2 Multiplication

2.16.3 EDUCATOR SECTION

2.16.4 Memorandum

	420 ÷ 40		9,952
	1 500 ÷ 50		28,358
	4 440 ÷ 30		143,065
	25 240 ÷ 40		573,545
	68 440 ÷ 70		1052,877

Table 2.29

2.16.5 BRAIN TEASERS

x Divider with answer / number before the comma.

Subtract this answer from the dividend.

2.16.6 LEANER SECTION

2.16.7 Content

Activity: To use a range of techniques for performing calculations [LO 1.10.2, LO 1.10.5]

1. It helps a lot to first ESTIMATE an answer before you calculate the quotient. Work through the following examples with a friend:

---

[16] This content is available online at <http://cnx.org/content/m31925/1.1/>.

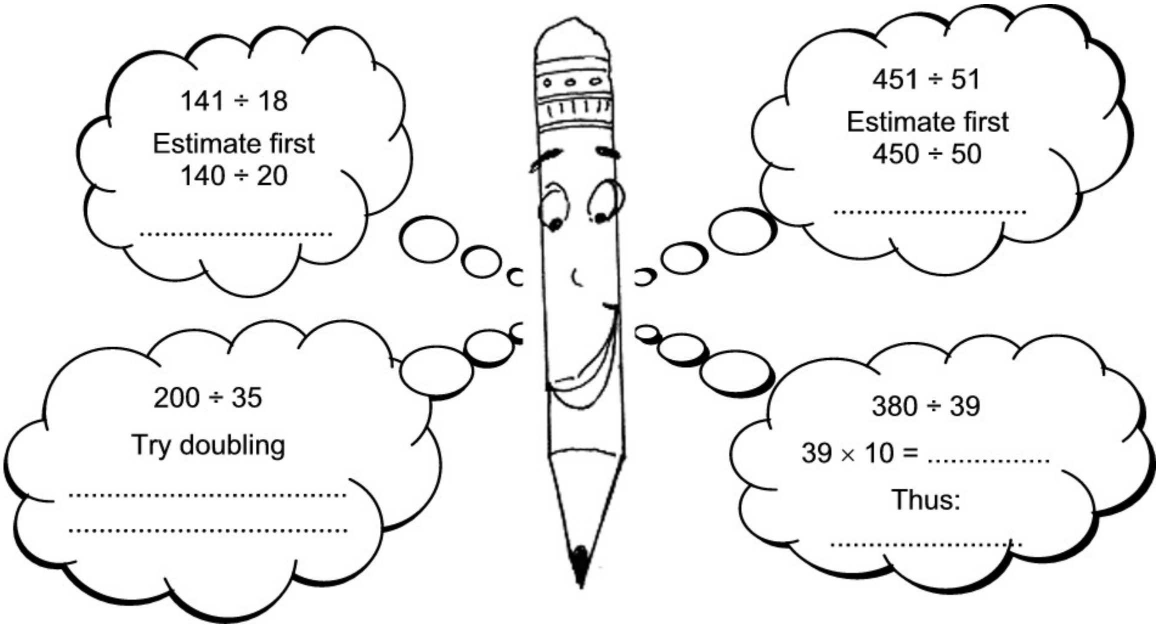

Figure 2.11

2. Complete the following table on your own. You may use a calculator for the answers in the last column.

	SUM	ROUND OFF	ESTIMATED ANSWER	ACTUAL ANSWER
E.g.	87 ÷ 22	90 ÷ 20	4	4,5
2.1	418 ÷ 42	....	....	....
2.2	1 503 ÷ 53	....	....	....
2.3	4 435 ÷ 31	....	....	....
2.4	25 236 ÷ 44	....	....	....
2.5	68 437 ÷ 65	....	....	....

Table 2.30

Did you know?

In the sum 77 ÷ 22 = 3,5, the ,5 shown on the calculator is **NOT** the remainder but actually a decimal fraction!

,5 = 5 tenths

77 ÷ 22 = 3 rem 11

- Can you see that ,5 is not equal to 11, but

to 0,5 of 22, which is 11?

BRAIN-TEASER!

- How can you use your calculator to find a whole number remainder?

____

____

____

____

____

____

2.16.8 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.10: We know this when the learner uses a range of techniques to perform written and mental calculations with whole numbers including:
1.10.2: long division;
1.10.5: using a calculator.

2.17 To use a range of techniques for performing calculations[17]

2.17.1 MATHEMATICS

2.17.2 Multiplication

2.17.3 EDUCATOR SECTION

2.17.4 Memorandum

1.1 351 rem 5
1.2 19 rem 120
1.3 16 rem 420
1.4 60 rem 1 536

2.17.5 LEANER SECTION

2.17.6 Content

2.17.6.1 Activity 2.5To use a range of techniques for performing calculations [LO 1.10.5]

1. Calculate the following with your calculator. The remainder may not be written as a decimal fraction but as an answer with a remainder, like in a normal division sum.

1.1 y = 356 ÷ 27

____

____

____

____

1.2 h = 4 984 ÷ 256

____

____

____

____

1.3 q = 13 684 ÷ 829

____

---

[17] This content is available online at <http://cnx.org/content/m20984/1.1/>.

____
____
____
1.4 p = 148 896 ÷ 2 456
____
____
____
____

2.17.7 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.10: We know this when the learner uses a range of techniques to perform written and mental calculations with whole numbers including:
1.10.5: using a calculator.

2.18 To investigate and extend patterns[18]

2.18.1 MATHEMATICS

2.18.2 Division

2.18.3 EDUCATOR SECTION

2.18.4 Memorandum

2. Consists of consecutive numbers.
3.
15,3243243
18,3243243
21,3243243

2.18.5 LEANER SECTION

2.18.6 Content

2.18.6.1 Activity: To investigate and extend patterns [LO 2.1.4]

There are many interesting patterns in mathematics – not only geometric patterns, but numerical patterns as well.

1. Look at the following interesting patterns while you have your calculator with you.
123 ÷ 37 = ____________________________________
234 ÷ 37 = ____________________________________
345 ÷ 37 = ____________________________________
456 ÷ 37 = __________________________________
2. What do you notice as you study the dividends in 1?
____
3. Predict now (without your calculator!):
a) 567 ÷ 37 = ____________________________________
b) 678 ÷ 37 = ____________________________________

---

[18] This content is available online at <http://cnx.org/content/m20985/1.1/>.

c) 789 ÷ 37 = _________________________________

4. Now check your answers with the calculator.

BRAIN-TEASER!

Look at the following interesting figure:

Can you divide this figure into two pentagons (5-sided figures) and three rectangles, by only drawing two straight lines?

Image not finished

Figure 2.12

2.18.7 Assessment

Learning Outcome 2: The learner will be able to recognise, describe and represent patterns and relationships, as well as to solve problems using algebraic language and skills.

Assessment Standard 2.1: We know this when the learner investigates and extends numeric and geometric patterns looking for a relationship or rules, including patterns:

2.1.4: of the learner's own creation.

2.19 To use a range of techniques to perform calculations[19]

2.19.1 MATHEMATICS

2.19.2 Division

2.19.3 EDUCATOR SECTION

2.19.4 Memorandum

2.19.5 LEANER SECTION

2.19.6 Content

2.19.6.1 Activity: To use a range of techniques to perform calculations [LO 1.10.2]

Divide the class into groups of three. Ask the educator for the paper that you will need and answer the following questions as accurately and neatly as you can:

1. The product of two numbers is 20 856. If one of the numbers is 79, what is the other number?
2. Mr Dlamini's heart beats at a rate of 4 500 beats in one hour. How many times will it beat in a minute?
3. At a particular prize draw the announcer says that the winning number is exactly divisible by 26. The number on Zwandor's ticket is 15 249. Does he have the winning ticket?
4. If 293 identical elephant tusks weigh 21 975 kg in total, how much will one of them weigh?
5. Buses are hired to transport 48 675 spectators to a soccer match. How many buses will be needed to get everyone to the soccer match if each bus can take 113 spectators?
6. Check your answers with the help of a pocket calculator.

---

[19] This content is available online at <http://cnx.org/content/m20988/1.1/>.

7. Explain how your group calculated the answers to the rest of the class.
8. Compare your methods. How do they differ?

2.19.6.1.1 GROUP ASSESSMENT

Evaluate yourselves on a scale of 1– 4.

CRITERIA	1	2	3	4
Co-operation within group	Needs attention	Fairly good	Very good	Outstanding
Neatness of calculations	Needs attention	Fairly good	Very good	Outstanding
Mathematical errors	0 - 29 % error free	30 - 49 % error free	50 -79 % error free	80 -100 % error free

Table 2.31

Did you know?
Dinosaurs had up to 2 400 teeth in their mouths, while we
only have 28!

2.19.7 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.10: We know this when the learner uses a range of techniques to perform written and mental calculations with whole numbers including:

1.10.2: long division.

2.20 To determine the equivalence and validity of a variety of representations[20]

2.20.1 MATHEMATICS

2.20.2 Division

2.20.3 EDUCATOR SECTION

2.20.4 Memorandum

2.20.5 LEANER SECTION

2.20.6 Content

2.20.6.1 Activity: To determine the equivalence and validity of a variety of representations [LO 2.6.3]

2.20.6.2 To use a variety of strategies to check solutions [LO 1.11]

Activity 2.7 has shown that there are different methods for calculating a quotient. Work through the different solutions to the following problem (with a partner):

---

[20] This content is available online at <http://cnx.org/content/m20991/1.1/>.

How many people together would have the same amount of teeth as one of these dinosaurs?
1. I must divide 2 400 by 28.
I estimate 28 goes into 2 400
about 50 times.
I know 28 x 100 = 2 800
Thus: 28 x 50 = 1 400
And 28 x 25 = 700

$$\begin{array}{rl} 2\,4\,0\,0 & \\ -\;1\,4\,0\,0 & \text{(50 x 28)} \\ \hline 1\,0\,0\,0 & \\ -\;7\,0\,0 & \text{(25 x 28)} \\ \hline 3\,0\,0 & \\ -\;2\,8\,0 & \text{(10 x 28)} \\ \hline 2\,0 & \end{array}$$

Figure 2.13

The answer is thus 50 + 25 + 10 = 85 people. 20 teeth are left over.
2. I must calculate 2 400 ÷ 28 in this way:

$$\begin{array}{r|l} & \;8\,5 \\ \cline{2-2} 2\,8 & 2\,4\,0\,0 \\ & \underline{-\,2\,2\,4}\;\; \text{8 x 28} \\ & \;\;\;1\,6\,0 \\ & \;\;\underline{-\,1\,4\,0}\;\; \text{5 x 28} \\ & \;\;\;\;\;\;2\,0 \end{array}$$

Figure 2.14

There are thus 85 people, because there are 8 teeth too few for another person.
3. Can you solve the problem in any other way without using a calculator?

____

____

____

____

____

____

2.20.7 Assessment

Learning Outcome 2: The learner will be able to recognise, describe and represent patterns and relationships, as well as to solve problems using algebraic language and skills.

Assessment Standard 2.6: We know this when the learner determines, through discussion and comparison, the equivalence of different descriptions of the same relationship or rule presented:

2.6.3: by number sentences.

2.20.8 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.11: We know this when the learner uses a range of strategies to check solutions and judge the reasonableness of solutions.

2.21 To use a range of techniques to perform calculations[21]

2.21.1 MATHEMATICS

2.21.2 Division

2.21.3 EDUCATOR SECTION

2.21.4 Memorandum

1.1 7
1.2 9
1.3 12
1.4 5
1.5 64
1.6 17
1.7 23
1.8 43
1.9 26
1.10 1 555
1.11 10
1.12 72
1.13 54
1.14 11
1.15 2 709

2.21.5 LEANER SECTION

2.21.6 Content

2.21.6.1 Activity: To use a range of techniques to perform calculations [LO 1.10.2]

Let us see how well you are able to apply your acquired knowledge of division. Calculate the following without using a pocket calculator. You may use whichever method you prefer.

1. t = 1 528 ÷ 24

____
____
____
____
____

---

[21] This content is available online at <http://cnx.org/content/m20995/1.1/>.

– –
– –
– –

2. g = 10 001 ÷ 32

– –
– –
– –
– –
– –
– –
– –
– –

3. y = 48 867 ÷ 26 4.

– –
– –
– –
– –
– –
– –
– –
– –

4. z = 57 906 ÷ 374

– –
– –
– –
– –
– –
– –
– –
– –

5. d = 126 458 ÷ 519

– –
– –
– –
– –
– –
– –
– –
– –

BRAIN-TEASER!

During a competition, the Grade 5, 6 and 7's tie. 21 cool drink cans are delivered to them at the school. Seven of the cans are completely full and 7 are half-full. Seven empty cans are also delivered.

How will you divide the cool drink among the three grades so that everyone gets the same amount of cool drink and cans? (Hint: make a sketch!)

TIME FOR SELF-ASSESSMENT

It is important for us to know how you feel about the section of the work that you have just completed. Evaluate yourself by placing a tick in the appropriate space:

I can estimate the quotient by rounding off the divisor and the dividend. (LO 1.10)		– – – –	– – – –	– – – –	– – – –
I can estimate the quotient by making use of doubling. (LO 1.10)		– – – –	– – – –	– – – –	– – – –
I can estimate the quotient by making use of multiplication. (LO 1.10)		– – – –	– – – –	– – – –	– – – –
I can predict the quotient by looking at certain patterns on my calculator. (LO 2.1)		– – – –	– – – –	– – – –	– – – –
I can divide correctly and determine a remainder, without using my calculator. (LO 1.11)		– – – –	– – – –	– – – –	– – – –

Table 2.32

** Ask your educator's help!

2.21.7 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.10: We know this when the learner uses a range of techniques to perform written and mental calculations with whole numbers including:

1.10.2: long division.

2.22 To perform mental calculations[22]

2.22.1 MATHEMATICS

2.22.2 Division

2.22.3 EDUCATOR SECTION

2.22.4 Memorandum

2.22.5 LEANER SECTION

2.22.6 Content

2.22.6.1 Activity: To perform mental calculations [LO 1.9.3]

1. You have done a lot of division with large numbers. Can you still do it with smaller numbers? Complete the following mental calculation test as neatly and accurately as possible. Connect the correct answers to see what is hiding here.

1.1 35 ÷ 5 = _
1.2 36 ÷ 4 = _
1.3 96 ÷ 8 = _
1.4 125 ÷ 25 = _
1.5 6 400 ÷ 10 = _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
1.6 85 ÷ 5 = _
1.7 92 ÷ 4 = _
1.8 258 ÷ 6 = _
1.9 182 ÷ 7 = _
1.10 Halve 3 110: _
1.11 10 ÷ 10 = _
1.12 _ ÷ 9 = 8
1.13 _. ÷ 6 = 9
1.14 132 ÷ _ = 12
1.15 Halve 5 418: _
15
Complete: A .... was hiding away

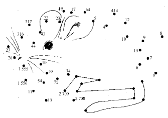

Figure 2.15

2.22.7 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

---

[22] This content is available online at <http://cnx.org/content/m20996/1.1/>.

Assessment Standard 1.9: We know this when the learner performs mental calculations involving:
1.9.3: division with small numbers.

2.23 To solve problems in context[23]

2.23.1 MATHEMATICS

2.23.2 Division

2.23.3 EDUCATOR SECTION

2.23.4 Memorandum

2.23.5 LEANER SECTION

2.23.6 Content

2.23.6.1 Activity: To solve problems in context [LO 1.6.1]

** This task will be placed in your portfolio. You will need a newspaper for this activity. Read the assignment carefully and answer the questions that follow. Work as neatly as you can, but have a good look at what your educator will be assessing before you start the task.

1. Use your local newspaper for examples and prices of the following items. Cut them out and paste them below. Write the prices below each example.

1.1 Colour TV

1.2 Computer

1.3 'Fridge 1.4 Cell phone

2. Imagine you have R40 000 to spend. How many of these items would you be able to afford? (You may use your calculator)

Colour TV: ____

Computer: ____

Fridge: ____

Cell phone: ____

3. Also look for advertisements from a local supermarket. Paste in examples of the following items and write their prices below each example:

3.1 one litre of milk

3.2 a loaf of brown bread

3.3 a kilogram of cheese 3.4 a packet of sugar

4. Imagine you have R250,00 to spend. How many of the above-mentioned items would you be able to buy? (You may use your calculator)

4.1 Milk: ____

4.2 Bread: ____

4.3 Cheese: ____

4.4 Sugar: ____

5. Colour the correct answer in:

---

[23] This content is available online at <http://cnx.org/content/m20998/1.1/>.

The newspaper activities were.	EASY	DIFFICULT
I could calculate the answers.	YES	NO
I could round off the cents correctly.	YES	NO

Table 2.33

2.23.7 ASSESSMENT: NEWSPAPER-BASED ACTIVITY

CRITERIA	1	2	3	4
Neatness	The cutting out is done untidily.Pasting down lacks thoroughness.	Cutting out is done untidily. Everything is pasted into position.	Cutting out is fairly neat. Pasting is done fairly well.	The cutting out is very neat. Pasting down is done thoroughly.
Completeness	The advertisement is not cut out. Some answers have been left unanswered.	Much of the information is lacking.	Only very few questions are not answered.	The assignment is completed fully.
Mathematical errors	0 - 29% error free	30 - 49% error free.	50 - 78% error free.	80 - 100% error free.

Table 2.34

2.23.7.1

2.23.7.2 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.6: We know this when the learner solves problems in context including contexts that may be used to build awareness of other Learning Areas, as well as human rights, social, economic and environmental issues such as:

1.6.1: financial (including buying and selling, profit and loss, simple budgets, reading and interpreting accounts, and discount).

2.24 To perform mental calculations[24]

2.24.1 MATHEMATICS

2.24.2 Division

2.24.3 EDUCATOR SECTION

2.24.4 Memorandum

2.24.5 LEANER SECTION

2.24.6 Content

2.24.6.1 Activity: To perform mental calculations [LO 1.9.3]

- Let us play a game!

Play with a friend. You will each need a dice and sixteen markers. Make two boards of stiff cardboard that look like this:

- Each player now writes the following numbers on his board. You may write them where you want to.

20 ; 24 ; 32 ; 39 ; 40 ; 41 ; 48 ; 57 ; 59 ; 61 ; 66 ; 68 ; 69 ; 79 ; 86 ; 90

- When you are ready, number 1 throws the dice.
- The number that shows on the dice, is the **REMAINDER that you will get when you divide a number on the board by 7**. Close that number with one of your markers. Take turns to play. The player whose board is full of markers first, is the winner.

2.24.7 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.9: We know this when the learner performs mental calculations involving:
1.9.3: division with small numbers.

2.24.7.1 TEST 20

1. Fill in the missing words:

1.1 Any number divided by 1 is____
1.2 When we divide a number by 2, we say we ___________________________
the number. (2)

2. Complete the following flow diagrams:

---

[24] This content is available online at <http://cnx.org/content/m21000/1.1/>.

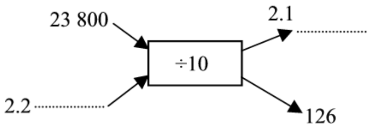

Figure 2.16

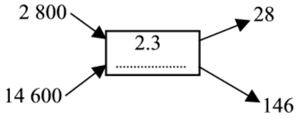

Figure 2.17

(3)

3. Estimate the quotient by first rounding off the divisor to the nearest 10 and the dividend to the nearest 100:

3.1 2 468 ÷ 47 = ____

= ____(2)

3.2 3 639 ÷ 33 = ____

= ____(2)

4. Valerie had to calculate the following: 32 876 ÷ 26. She started, but could not complete the calculation. Complete the sum for her.

				1			
2	6		3	2	8	7	6
		-	2	6			

Table 2.35

____
____
____
____
____
____
____
____________________________________ (3)

5. Calculate the following without a calculator:

5.1 A fruit vendor buys 8 498 apples and packs them in boxes containing 35 apples each. How many boxes does he need?

____
____

____

____

____

____

____

____

(4)

5.2 How many rolls of chicken netting is needed to fence a camp of 1 598 m if each roll contains 45 m?

____

____

____

____

____

____

____

____

(4)

2.25 To recognise and classify numbers in order to describe and compare them[25]

2.25.1 MATHEMATICS

2.25.2 Common and Decimal Fractions

2.25.3 Common Fractions

2.25.4 EDUCATOR SECTION

2.25.5 Memorandum

INTRODUCTION

The learning programme for grade six consists of five modules:

1. Number concept, Addition and Subtraction
2. Multiplication and Division
3. Fractions and Decimal fractions
4. Measurement and Time
5. Geometry; Data handling and Probability

- It is important that educators complete the modules in the above sequence, as the learners will require the knowledge and skills acquired through a previous module to be able to do the work in any subsequent module.

COMMON AND DECIMAL FRACTIONS (LO 1; 2 AND 5)

LEARNING UNIT 1 FOCUSES ON COMMON FRACTIONS

- This module continues the work dealt with in grade 5. Addition and subtraction of fractions are extended and calculation of a fraction of a particular amount is revised.
- Check whether the learners know the correct terminology and are able to use the correct strategies for doing the above correctly.

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[25] This content is available online at <http://cnx.org/content/m30956/1.1/>.

- Critical outcome 5 (Communicating effectively by using visual, symbolic and /or language skills in a variety of ways) is addressed.
- It should be possible to work through the module in 3 weeks.
- ** Activity 17 is designed as a portfolio task. It is a very simple task, but learners should do it neatly and accurately. They must be informed in advance of how the educator will be assessing the work.
- LEARNING UNIT 2 FOCUSES ON DECIMAL FRACTIONS
- This module extends the work that was done in grade 5. Learners should be able to do rounding of decimal fractions to the nearest tenth, hundredth and thousandth. Emphasise the use of the correct method (vertical) for addition and subtraction. Also spend sufficient time on the multiplication and division of decimal fractions.
- As learners usually have difficulty with the latter, you could allow 3 to 4 weeks for this section of the work.
- ** Activity 19 is a task for the portfolio. The assignment is fairly simple, but learners should complete it neatly and accurately. They must be informed in advance of how the educator will be assessing the work.

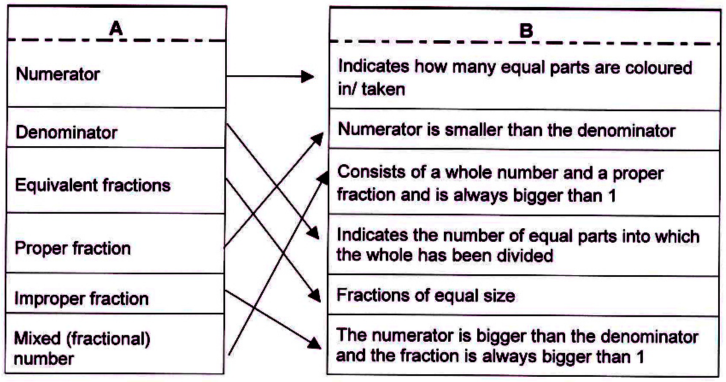
A
Numerator
Denominator
Equivalent fractions
Proper fraction
Improper fraction
Mixed (fractional) number
B
Indicates how many equal parts are coloured in/ taken
Numerator is smaller than the denominator
Consists of a whole number and a proper fraction and is always bigger than 1
Indicates the number of equal parts into which the whole has been divided
Fractions of equal size
The numerator is bigger than the denominator and the fraction is always bigger than 1

Figure 2.18

1. A: $\frac{6}{16}$ B: $\frac{1}{16}$ C: $\frac{2}{16}/\frac{1}{8}$

A + C: $\frac{8}{16}/\frac{1}{2}$ B + C: $\frac{3}{16}$ C + D: $\frac{6}{16}/\frac{3}{8}$

A + D: $\frac{10}{16}/\frac{5}{8}$ A + B: $\frac{7}{16}$ B + D: $\frac{5}{16}$

2. Proper
3.

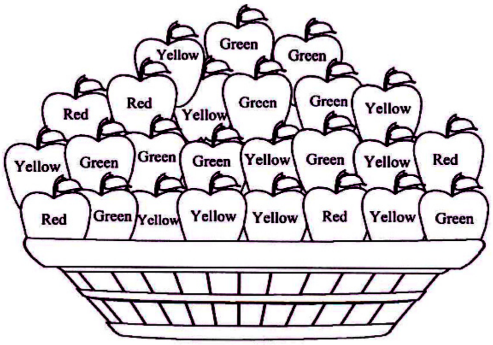

Figure 2.19

4.	IMPROPER FRACTION	**MIXED NUMBER**
4.1	$\frac{14}{4}$	$3\ \frac{1}{2}$
4.2	$\frac{19}{6}$	$3\ \frac{1}{6}$
4.3	$\frac{15}{7}$	$2\ \frac{1}{7}$
4.4	$\frac{11}{8}$	$1\ \frac{3}{8}$
4.5	$\frac{9}{2}$	$4\ \frac{1}{2}$

Table 2.36

2.25.6 LEANER SECTION

2.25.7 Content

2.25.7.1 Common Fractions

In Grade 5 we spent much time working with fractions. Before beginning this year's work, we need to know how well you can remember what you have learned! See if you can link the words in column A with the correct meanings in column B:

A		B
Numerator		Indicates how many equal parts are coloured in/ taken
Denominator		Numerator is smaller than the denominator
Equivalent fractions		Consists of a whole number and a proper fraction and is always bigger than 1
Proper fraction		Indicates the number of equal parts into which the whole has been divided
Improper fraction		Fractions of equal size
Mixed (fractional) number		The numerator is bigger than the denominator and the fraction is always bigger than 1

Table 2.37

2.25.7.2 ACTIVITY: To recognise and classify numbers in order to describe and compare them [LO 1.3.3]

1. Kom ons hersien nog! Werk saam met 'n maat en sê watter breukdeel van die vierkant Work with a friend and indicate which fraction of the square is represented by:

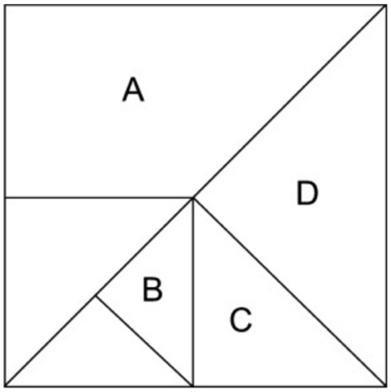

Figure 2.20

A : ……………………………………………………
B : ……………………………………………………
C : ……………………………………………………
A + C : ……………………………………………...
B + C : ……………………………………………...

C + D : ……………………………………………………...
A + D : ……………………………………………………...
A + B : ……………………………………………………...
B + D : ……………………………………………………...

2. All the answers comprise …………………………………………………….... fractions.

3. Take a look at the picture of the bowl of apples. Colour the apples that represent proper fractions yellow, the improper fractions green and the mixed numbers red.

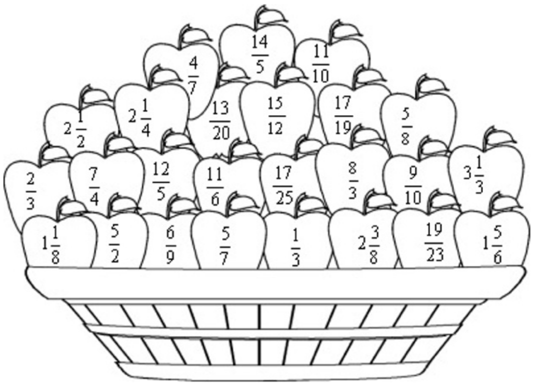

Figure 2.21

4. Complete the table:

		IMPROPER FRACTION	MIXED NUMBER
E.g.	thirteen fifths	$\frac{13}{5}$	$2\frac{3}{5}$
4.1	fourteen quarters		
4.2	nineteen sixths		
4.3	fifteen sevenths		
4.4	eleven eighths		
4.5	nine halves		

Table 2.38

2.25.8 Assessment

Learning Outcome 1:The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.3: We know this when the learner recognises and represents the following numbers in order to describe and compare them:

1.3.3 common fractions, including specifically tenths, hundreds and percentages.

2.26 To calculate by selecting operations appropriate for solving problems[26]

2.26.1 MATHEMATICS

2.26.2 Common and Decimal Fractions

2.26.3 Common Fractions

2.26.4 EDUCATOR SECTION

2.26.5 Memorandum

INTRODUCTION

The learning programme for grade six consists of five modules:

1. Number concept, Addition and Subtraction
2. Multiplication and Division
3. Fractions and Decimal fractions
4. Measurement and Time
5. Geometry; Data handling and Probability

- It is important that educators complete the modules in the above sequence, as the learners will require the knowledge and skills acquired through a previous module to be able to do the work in any subsequent module.

COMMON AND DECIMAL FRACTIONS (LO 1; 2 AND 5)

LEARNING UNIT 1 FOCUSES ON COMMON FRACTIONS

- This module continues the work dealt with in grade 5. Addition and subtraction of fractions are extended and calculation of a fraction of a particular amount is revised.
- Check whether the learners know the correct terminology and are able to use the correct strategies for doing the above correctly.
- Critical outcome 5 (Communicating effectively by using visual, symbolic and /or language skills in a variety of ways) is addressed.
- It should be possible to work through the module in 3 weeks.
- ** Activity 17 is designed as a portfolio task. It is a very simple task, but learners should do it neatly and accurately. They must be informed in advance of how the educator will be assessing the work.

- LEARNING UNIT 2 FOCUSES ON DECIMAL FRACTIONS
- This module extends the work that was done in grade 5. Learners should be able to do rounding of decimal fractions to the nearest tenth, hundredth and thousandth. Emphasise the use of the correct method (vertical) for addition and subtraction. Also spend sufficient time on the multiplication and division of decimal fractions.
- As learners usually have difficulty with the latter, you could allow 3 to 4 weeks for this section of the work.
- ** Activity 19 is a task for the portfolio. The assignment is fairly simple, but learners should complete it neatly and accurately. They must be informed in advance of how the educator will be assessing the work.

1.1 $\frac{3}{6} = \frac{5}{10} = \frac{1}{2}$

1.2 $\frac{10}{15} = \frac{8}{12} = \frac{2}{3}$

---

[26] This content is available online at <http://cnx.org/content/m31928/1.1/>.

1.3 $\frac{6}{10} = \frac{3}{5}$
1.4 $\frac{10}{12} = \frac{5}{6}$

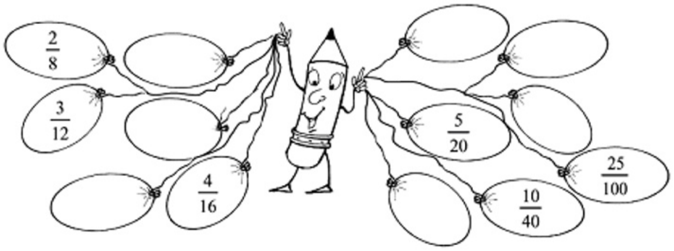

Figure 2.22

2.26.6 LEANER SECTION

2.26.7 Content

2.26.7.1 ACTIVITY: To calculate by selecting operations appropriate to solving problems [LO1.8.7]

It is important for you to understand what an equivalent fraction is and also how to obtain it, because this will help you to put the correct relationship sign between two fractions.

2.26.7.1.1 DO YOU REMEMBER THIS?

Fractions of equal size are known as **equivalent fractions**.

1. Take a good look at the illustrations and write down the equivalent fractions, e.g.

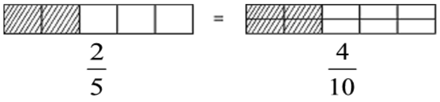

Figure 2.23

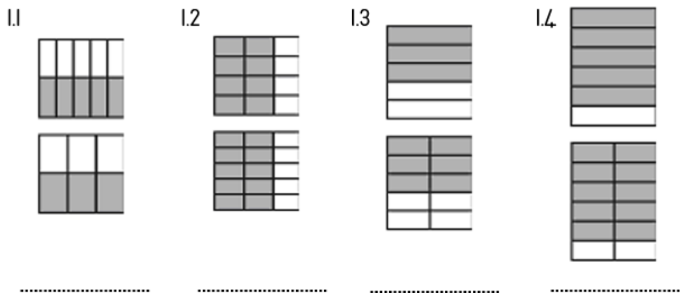

Figure 2.24

2. Colour in those balloons that are equal to one quarter:

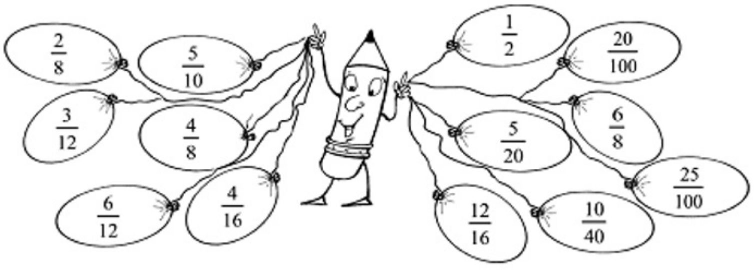

Figure 2.25

2.26.7.1.2 DID YOU KNOW?

Equivalent fractions make it possible to compare fractions with one another. If I have to fill in relationship signs, **the denominators of the fractions have to be made the same.**

$$\frac{3}{4} \boxed{} \frac{9}{12}$$

$$\frac{3 \times 3}{4 \times 3} = \frac{9}{12}$$

Figure 2.26

E.g.

2.26.8 Assessment

Learning Outcome 1:The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.8: We know this when the learner estimates and calculates by selecting and using operations appropriate to solving problems that involve:

1.8.7 equivalent fractions.

2.27 To recognise and classify numbers in order to describe and compare them[27]

2.27.1 MATHEMATICS

2.27.2 Common and Decimal Fractions

2.27.3 Common Fractions

2.27.4 EDUCATOR SECTION

2.27.5 Memorandum

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3. Fractions and Decimal fractions
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5. Geometry; Data handling and Probability

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COMMON AND DECIMAL FRACTIONS (LO 1; 2 AND 5)

LEARNING UNIT 1 FOCUSES ON COMMON FRACTIONS

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- It should be possible to work through the module in 3 weeks.
- ** Activity 17 is designed as a portfolio task. It is a very simple task, but learners should do it neatly and accurately. They must be informed in advance of how the educator will be assessing the work.

- LEARNING UNIT 2 FOCUSES ON DECIMAL FRACTIONS
- This module extends the work that was done in grade 5. Learners should be able to do rounding of decimal fractions to the nearest tenth, hundredth and thousandth. Emphasise the use of the correct method (vertical) for addition and subtraction. Also spend sufficient time on the multiplication and division of decimal fractions.

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[27] This content is available online at <http://cnx.org/content/m30960/1.1/>.

- As learners usually have difficulty with the latter, you could allow 3 to 4 weeks for this section of the work.
- ** Activity 19 is a task for the portfolio. The assignment is fairly simple, but learners should complete it neatly and accurately. They must be informed in advance of how the educator will be assessing the work.

1.1
a) $\frac{11}{8}$ 1
b) $\frac{4}{8}$
c) $\frac{16}{8}$
d) $\frac{6}{4}$
e) $\frac{6}{8}$
1.2
a) $\frac{1}{4}$
b) $\frac{6}{8}$
c) $\frac{2}{4}\frac{4}{8}$
d) $\frac{5}{4}$
e) $\frac{3}{2}\frac{6}{4}$
f) $\frac{14}{8}$
g) $\frac{8}{4}\frac{16}{8}$
2. **BRAIN TEASER!**
2.1 $\frac{6}{12}$
2.2 $\frac{12}{15}$
2.3 $\frac{6}{7}$
2.4 $\frac{8}{9}$
2.5 $\frac{5}{10}$
3.

- >

3.2 <

- =

3.4 <
3.5 First make denominators the same

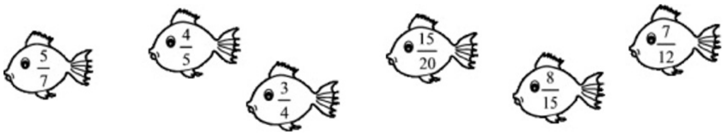

Figure 2.27

4.
5.

- <

5.2 >
5.3 First find common denominator
6.

- 63

6.2 20

- 18

6.4 40

6.5 10
7.
7.1 $\frac{2}{5}$
7.2 $\frac{4}{9}$
7.3 $\frac{4}{7}$

2.27.6 LEANER SECTION

2.27.7 Content

2.27.7.1 ACTIVITY: To recognise and classify numbers in order to describe and compare them [LO 1.3.3]

We have looked at fractions on a number line in earlier grades. When they are positioned as clearly as they are on the number line below, it is child's play to compare them with each other and determine which are equivalent, which are larger or which are smaller than a given fraction. Here we have a few exercises to see if you are able to apply your knowledge of equivalent fractions correctly.

1. Examine the following diagram.

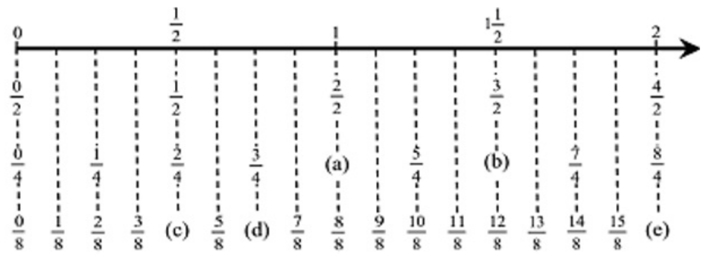

Figure 2.28

1.1 Write down the fractions that are missing:
a) …………………………………………………………
b) …………………………………………………………
c) …………………………………………………………
d) …………………………………………………………
e) …………………………………………………………
1.2 Write equivalent fractions for:
a) $\frac{2}{8}$ …………………………………………………………
b) $\frac{3}{4}$ …………………………………………………………
c) $\frac{1}{2}$ …………………………………………………………
d) $\frac{10}{8}$ …………………………………………………………
e) $\frac{12}{8}$ …………………………………………………………

f) $\frac{7}{4}$ ....

g) $\frac{4}{2}$ ....

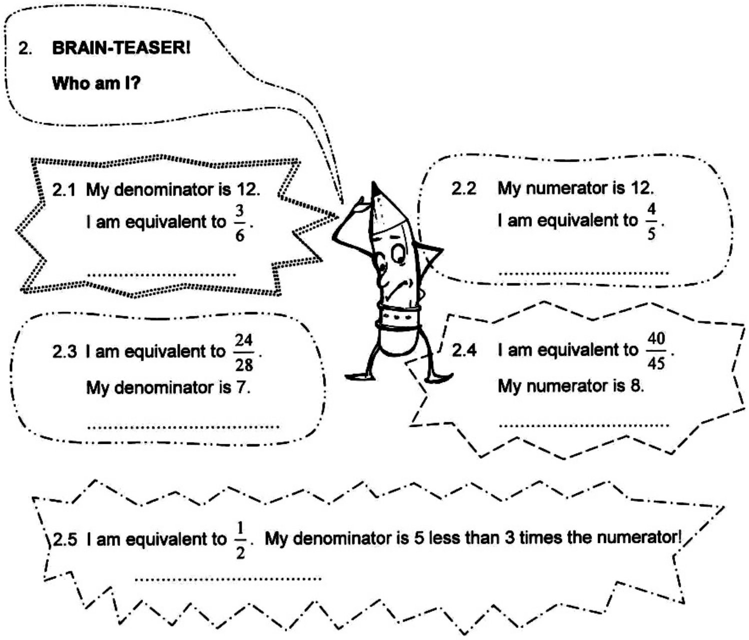
2. BRAIN-TEASER!
Who am I?
2.1 My denominator is 12. I am equivalent to $\frac{3}{6}$. ....
2.2 My numerator is 12. I am equivalent to $\frac{4}{5}$. ....
2.3 I am equivalent to $\frac{24}{28}$. My denominator is 7. ....
2.4 I am equivalent to $\frac{40}{45}$. My numerator is 8. ....
2.5 I am equivalent to $\frac{1}{2}$. My denominator is 5 less than 3 times the numerator! ....

Figure 2.29

---

3. Fill in: $<$; $>$ or $=$:

3.1 $\frac{5}{6}$ .... $\frac{2}{3}$

3.2 $\frac{4}{5}$ .... $\frac{9}{10}$

3.3 $\frac{7}{9}$ .... $\frac{21}{27}$

3.4 $\frac{5}{8}$ .... $\frac{21}{32}$

3.5 Are you able to explain how you found the answers?

4. Help to "catch" all the fish that have a value above $\frac{1}{2}$ by colouring them in neatly.

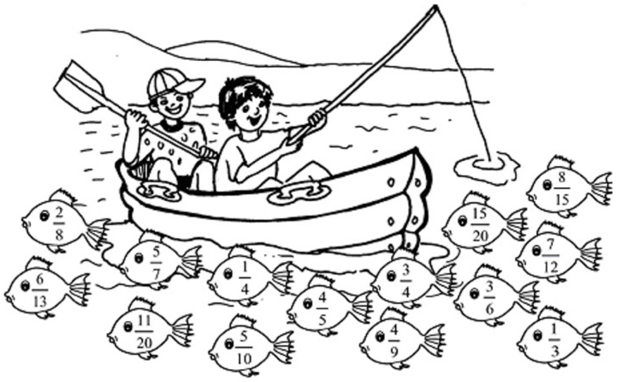

Figure 2.30

5. Work with a friend and fill in: < ; > or = :
5.1 $\frac{3}{4}$ .... $\frac{5}{6}$
5.2 $\frac{2}{3}$ .... $\frac{3}{5}$
5.3 Explain to the rest of the class how you arrived at the answer.
6. Complete the following table:

	FRACTIONS	COMMON DENOMINATOR
E.g.	$\frac{1}{2}$, $\frac{1}{3}$	6
6.1	$\frac{1}{9}$, $\frac{1}{7}$	
6.2	$\frac{1}{4}$, $\frac{1}{5}$	
6.3	$\frac{1}{6}$, $\frac{1}{9}$	
6.4	$\frac{1}{5}$, $\frac{1}{8}$	
6.5	$\frac{1}{2}$, $\frac{1}{5}$	

Table 2.39

7. Draw a circle round the smallest fraction:
7.1 $\frac{2}{3}$, $\frac{3}{6}$
7.2 $\frac{3}{8}$, $\frac{4}{9}$
7.3 $\frac{4}{7}$, $\frac{3}{4}$

2.27.7.1.1 TIME FOR SELF-ASSESSMENT

How have you managed up to now? Are you ready for the next section of the work? Assess yourself on a scale of 1 - 4 to show us how you are coping:

1. = needs attention

2 = fairly good3 = very good
4 = outstanding

CRITERIA	CODE			
I could match the words to the correct explanation on p. 3.	1	2	3	4
I could answer no. 1 of Activity 1.1 correctly.	1	2	3	4
I could find the proper fractions in no. 3. (LO 1.3)				
I could find the improper fractions in no. 3. (LO 1.3)	1	2	3	4
I could find the mixed numbers in no. 3. (LO 1.3)	1	2	3	4
I could complete the table correctly in no. 4. (LO 1.3)	1	2	3	4
I could explain what equivalent fractions are. (LO 1.8)	1	2	3	4
I could correctly indicate my own equivalent fractions for $\frac{1}{4}$ in no. 5.2. (LO 1.8)	1	2	3	4
I could also write down equivalent fractions for other fractions (no. 6).	1	2	3	4
I could fill in relationship signs correctly.	1	2	3	4

Table 2.40

2.27.8 Assessment

Learning Outcome 1:The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.3: We know this when the learner recognises and represents the following numbers in order to describe and compare them:

1.3.3 common fractions, including specifically tenths, hundreds and percentages.

2.28 To perform mental calculations[28]

2.28.1 MATHEMATICS

2.28.2 Common and Decimal Fractions

2.28.3 Common Fractions

2.28.4 EDUCATOR SECTION

2.28.5 Memorandum

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[28] This content is available online at <http://cnx.org/content/m30961/1.1/>.

COMMON AND DECIMAL FRACTIONS (LO 1; 2 AND 5)
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- LEARNING UNIT 2 FOCUSES ON DECIMAL FRACTIONS
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1.1 48
1.2 5
1.3 6
1.4 6
1.5 $\frac{6}{9}$
1.6 $\frac{20}{28}$
1.7 $\frac{24}{36}$
1.8 $\frac{16}{20}$
1.9 33
1.10 951
1.11 9995
1.12 49
1.13 33
1.14 108
1.15 12

2.28.6 LEANER SECTION

2.28.7 Content

2.28.7.1 ACTIVITY: To perform mental calculations [LO 1.9.1, LO 1.9.2]

Let's see how you cope in the first mental arithmetic test!

1.1 8 × 6 = ...	1.9. 37 + ... = 70
1.2. 7 × .... = 35	1.10. 1 000 – 49 = ...
1.3. 42 ÷ 7 = ...	1.11. 10 003 – 8 = ...
1.4. 54 ÷ .... = 9	1.12. 16 + 18 + 15 = ...
1.5. $\frac{2}{3} = \frac{}{9}$	1.13. 27 + ... = 60
1.6. $\frac{5}{7} = \frac{20}{}$	1.14. 12 × 9 = ...
1.7. $\frac{}{6} = \frac{24}{36}$	1.15. 96 ÷ .... = 8
1.8. $\frac{4}{} = \frac{16}{20}$	

Table 2.41

Colour in: My results are	GOOD	AVERAGE	WEAK

Table 2.42

2.28.7.1.1 DO YOU REMEMBER THIS?

Simplification involves writing the fraction in a simpler form. This means that it is an equivalent fraction with a smaller numerator and denominator. For **simplifying** a fraction, we have tofind a number that can be used to divide the numerator and denominator exactly.

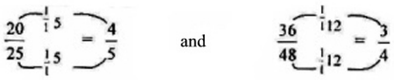

Figure 2.31

Remember to look for the largest number that can be used to divide!

2.28.8 Assessment

Learning Outcome 1:Die leerder is in staat om getalle en die verwantskappe daarvan te herken, te beskryf en voor te stel, en om tydens probleemoplossing bevoeg en met selfvertroue te tel, te skat, te bereken en te kontroleer.

Assessment Standard 1.9: We know this when the learner performs mental calculations involving:

1.9.1 addition and subtraction;

1.9.2 multiplication of whole numbers to at least 12 x 12.

2.29 To recognise equivalent forms of numbers To recognise equivalent forms of numbers[29]

2.29.1 MATHEMATICS

2.29.2 Common and Decimal Fractions

2.29.3 Common Fractions

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1.1 $\frac{2}{3}$
1.2 $\frac{13}{20}$
1.3 $\frac{5}{8}$
1.4 $\frac{2}{3}$

---

[29] This content is available online at <http://cnx.org/content/m30962/1.1/>.

2.29.6 LEANER SECTION

2.29.7 Content

2.29.7.1 ACTIVITY: To recognise equivalent forms of numbers To recognise equivalent forms of numbers [LO 1.5.1]

If you know how to simplify and to apply it correctly, you will soon realise that it is a helpful aid when calculating with fractions. It can help you multiply, divide, add and subtract more easily (and quickly). You will also find it easier to fill in relationship signs. Let's have a look at how you manage.

1. Simplify the following:
1.1 $\frac{10}{15}$
1.2 $\frac{26}{40}$
1.3 $\frac{45}{72}$
1.4 $\frac{42}{63}$
2. **LET'S PLAY A GAME!**
You'll need a partner and two dice.

- Roll both dice and write the numbers that are on top as a proper fraction.
- Simplify the fraction, if this is possible.
- Your friend has to do the same.
- Decide whose fraction is larger.
- The one with the larger fraction claims 2 points.
- The winner is the one who gains the most points!

2.29.7.1.1 DO YOU REMEMBER THIS?

When we wish to do addition with fractions, the denominators have to be made similar.
Eg. $\frac{1}{3} + \frac{3}{6}$
$\frac{1}{3} = \frac{2}{6}$

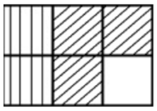

Figure 2.32

$\left(\frac{2}{6}\right)\frac{1}{3} + \frac{3}{6} = \frac{5}{6}$
What you know about determining equivalent fractions will be useful when you do this.

2.29.7.1.2 NOTE THE FOLLOWING!

When the sum of two fractions is calculated, **only** the **numerators** are added together. The denominator is retained as it is.

2.29.7.1.3 ALSO REMEMBER!

If the answer is an improper fraction, you have to convert it to a mixed number.

2.29.8 Assessment

Learning Outcome 1:Die leerder is in staat om getalle en die verwantskappe daarvan te herken, te beskryf en voor te stel, en om tydens probleemoplossing bevoeg en met selfvertroue te tel, te skat, te bereken en te kontroleer.

Assessment Standard 1.5: We know this when the learner recognises and uses equivalent forms of the numbers listed above, including:

1.5.1 common fractions with 1-digit or 2-digit denominators.

2.30 ACTIVITY: To calculate by selecting operations appropriate to solving problems[30]

2.30.1 MATHEMATICS

2.30.2 Common and Decimal Fractions

2.30.3 Common Fractions

2.30.4 EDUCATOR SECTION

2.30.5 Memorandum

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[30] This content is available online at <http://cnx.org/content/m30963/1.1/>.

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2.30.6 LEANER SECTION

2.30.7 Content

2.30.7.1 ACTIVITY: To calculate by selecting operations appropriate to solving problems [LO 1.8.3]

You have to work in groups of three for this activity. Ask your educator for the paper that you will need. Read the questions attentively and show the operations that you use for calculating the answers:

1. Mrs Samuels buys one third of a metre of pink material and five sixths of a metre of purple material. How many metres of material does she have to make cushions for her class?
2. The Jansen family is picnicking. If Dad eats a quarter of the food, Mom eats three eighths of it and Sarah two eighths, will there be any left for you to eat?
3. The Grade 6 learners have been asked to establish a vegetable garden at the school. If they plant half of the garden with carrots, two sixths with potatoes and one twelfth with spinach, what fraction of the whole garden has been planted?
4. Because they have worked so hard in the garden, the classes are rewarded. The 6A class drinks four and one fifth litres of cold drink; the 6B class drinks five and four tenths litres of cold drink and the 6C class drinks three and two thirds litres. How many litres of cold drink did the school provide for the learners?
5. Explain how your group calculated the answers to the rest of the class.
6. Compare your methods. How do they differ?

2.30.7.1.1 TIME FOR SELF-ASSESSMENT

Assess your work on a scale of 1 - 4 by circling the appropriate number:

1 = not at all 2 = just a little 3 = good 4 = outstanding

CRITERIA	CODE			
All group members participated in the activities.	1	2	3	4
Group members listened to one another.	1	2	3	4
Group members helped and encouraged each other.	1	2	3	4
Group members adhered to the instructions.	1	2	3	4
Each one had a chance to speak.	1	2	3	4
The group's work was neatly done.	1	2	3	4
The answers were calculated correctly.	1	2	3	4

Table 2.43

2.30.8 Assessment

Learning Outcome 1:The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.8: We know this when the learner estimates and calculates by selecting and using operations appropriate to solving problems that involve:

1.8.3 addition and subtraction of common fractions with denominators which are multiples of each other and whole numbers with common fractions (mixed numbers);

2.31 ACTIVITY: To calculate by selecting operations appropriate to solving problems[31]

2.31.1 MATHEMATICS

2.31.2 Common and Decimal Fractions

2.31.3 Common Fractions

2.31.4 EDUCATOR SECTION

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---

[31] This content is available online at <http://cnx.org/content/m30965/1.1/>.

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1.1 $\frac{7}{8}$
1.2 $\frac{14}{9} = 1\ \frac{5}{9}$
1.3 $\frac{18}{14} = 1\ \frac{2}{7}$
1.4 $\frac{14}{10} = \frac{2}{5}$

2.31.6 LEANER SECTION

2.31.7 Content

2.31.7.1 ACTIVITY: To calculate by selecting operations appropriate to solving problems [LO 1.8.3]

1. Now that we have revised the addition of fractions, you shouldn't have any difficulty with the following. Work on your own and calculate:

1.1 $\frac{1}{8} + \frac{3}{4}$
....
....
....
....
1.2 $\frac{2}{3} + \frac{8}{9}$
....
....
....
....
1.3 $\frac{4}{7} + \frac{10}{14}$
....
....
....
....
1.4 $\frac{9}{10} + \frac{1}{2}$
....
....
....
....

2.31.7.1.1 DO YOU KNOW THIS?

X 4X 4 We sometimes have to find a common denominator. In $\frac{1}{3} + \frac{1}{4}$ forinstance, it is difficult to change thirds into quarters or quarters into thirds. You find the common denominator by multiplying the two denominators. In our example, the common denominator is 3 x 4 = 12. We refer to 12 as the smallest common multiple of 3 and 4.

X 3X 3 Thus: $\frac{1}{3} + \frac{1}{4}$ ($\frac{1}{3} = \frac{4}{12}$)
$= \frac{4}{12} + \frac{3}{12}$ ($\frac{1}{4} = \frac{3}{12}$)
$= \frac{7}{12}$

This is what it looks like when we draw it:

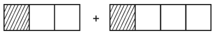

Figure 2.33

$\frac{1}{3}$ $\frac{1}{4}$

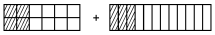

Figure 2.34

$\frac{4}{12}$ $\frac{3}{12}$

2.31.8 Assessment

Learning Outcome 1:The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.8: We know this when the learner estimates and calculates by selecting and using operations appropriate to solving problems that involve:

1.8.3 addition and subtraction of common fractions with denominators which are multiples of each other and whole numbers with common fractions (mixed numbers);

2.32 To calculate by selecting operations appropriate to solving problems[32]

2.32.1 MATHEMATICS

2.32.2 Common and Decimal Fractions

2.32.3 Common Fractions

2.32.4 EDUCATOR SECTION

2.32.5 Memorandum

INTRODUCTION

The learning programme for grade six consists of five modules:

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2. Multiplication and Division
3. Fractions and Decimal fractions
4. Measurement and Time
5. Geometry; Data handling and Probability

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[32] This content is available online at <http://cnx.org/content/m30967/1.1/>.

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COMMON AND DECIMAL FRACTIONS (LO 1; 2 AND 5)
LEARNING UNIT 1 FOCUSES ON COMMON FRACTIONS

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- LEARNING UNIT 2 FOCUSES ON DECIMAL FRACTIONS
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1.1 $\frac{8+15}{20} = \frac{23}{20}$
1.2 $\frac{3+4}{6} = \frac{7}{6} = 1\ \frac{1}{6}$
$= 1$
1.3 $\frac{6+20}{24} = \frac{26}{24}$
1.4 $\frac{5+12}{15} = \frac{17}{15} = 1\ \frac{2}{15}$

2.32.5.1 CLASS DISCUSSION

- Whole number + fraction
- First add whole numbers

First change all to improper fractions

2.32.6 LEANER SECTION

2.32.7 Content

2.32.7.1 ACTIVITY: To calculate by selecting operations appropriate to solving problems [LO 1.8.3]

1. Calculate by first finding the **common denominator (smallest common multiple)**:
   1.1 $\frac{2}{5} + \frac{3}{4}$
   ....
   ....
   ....

....

1.2 $\frac{1}{2}+\frac{2}{3}$

....

....

....

....

1.3 $\frac{1}{4}+\frac{5}{6}$

....

....

....

....

1.4 $\frac{1}{3}+\frac{4}{5}$

....

....

....

....

2.32.7.1.1 CLASS DISCUSSION:

- First explain what a **mixed number** is.

....

- Name the different methods for calculating the sum of two **mixed numbers.**

....

....

2.32.8 Assessment

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1.8.3 addition and subtraction of common fractions with denominators which are multiples of each other and whole numbers with common fractions (mixed numbers).

2.33 To solve problems in context[33]

2.33.1 MATHEMATICS

2.33.2 Common and Decimal Fractions

2.33.3 Common Fractions

2.33.4 EDUCATOR SECTION

2.33.5 Memorandum

INTRODUCTION

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1. Number concept, Addition and Subtraction

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[33] This content is available online at <http://cnx.org/content/m31670/1.1/>.

2. Multiplication and Division
3. Fractions and Decimal fractions
4. Measurement and Time
5. Geometry; Data handling and Probability

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- $5\ \frac{2+3}{4} = 5\ \frac{5}{4} = 1\ \frac{1}{4}$

1.2 $1\ \frac{5}{8} + 2\ \frac{2}{3}$

$3\ \frac{15+16}{24} = 3\ \frac{31}{24} = 4\ \frac{7}{8}$

1.3 $3\ \frac{1}{4} + 2\ \frac{1}{5}$

$5\ \frac{5+4}{20} = 5\ \frac{9}{20}$

2.

- $4\ \frac{1}{2}$
- $5\ \frac{19}{20}$

2.3 $5\ \frac{10}{21}$

BRAIN TEASER!

$1 + \frac{1}{2} = 1\frac{1}{2}$

$1 + \frac{1}{2} + \frac{1}{4} = 1$

$1 + \frac{1}{2} + \frac{1}{4} + \frac{1}{8} = 1\ \frac{7}{8}$

$1 + \frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \frac{1}{\mathbf{16}} = 1\ \frac{15}{16}$

$1 + \frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \frac{1}{\mathbf{16}} + \frac{1}{\mathbf{32}} = 1\ \frac{31}{32}$

$\frac{5}{2}$	3	$\frac{1}{2}$
0	2	4
$3\frac{1}{2}$	1	$1\frac{1}{2}$

Figure 2.35

CLASS DISCUSSION
4 Make denominators the same
4 Find lowest common multiple
4 Make all improper fractions
4 First subtract whole numbers

2.33.6 LEANER SECTION

2.33.7 Content

2.33.7.1 ACTIVITY: To solve problems in context [LO 1.6.2]

1. Pair up with a friend and work together to solve the following problem:

1.1 Mom uses $2\frac{1}{2}$ cups of sugar in one recipe and $3\frac{3}{4}$ cups of sugar in Altogether how many cups of sugar does she use?

____

____

1.2 At a birthday party, Rafiek and his friends eat one and five eighths of the ham and salami pizzas. They also eat two and two thirds of the ham and pineapple pizzas. What fraction of the pizzas did they eat altogether?

____

____

1.3 Rafiek and his friends also drank three and a quarter litres of Coke and two and one fifth litres of Cream Soda. What fraction of the cold drink did they drink?

____

____

2. Calculate the following by yourself:
2.1 $2\frac{5}{6} + 1\frac{2}{3}$
2.2 $3\frac{3}{4} + 2\frac{1}{5}$
2.3 $4\frac{1}{7} + 1\frac{1}{3}$
PUZZLE THIS OUT!

- Are you able to complete the fraction pattern?

$1 + \quad = 1\frac{1}{2}$

$1 + \frac{1}{2} + \frac{1}{4} = 1\frac{3}{4}$

$1 + \frac{1}{2} + \frac{1}{4} + \quad = 1$
$1 + \frac{1}{2} + \frac{1}{4} + += 1$
$1 + \frac{1}{2} + \frac{1}{4} + + + \quad = 1$

- Are you able to complete this magic square?

$\frac{5}{2}$	3	
	2	4
	1	

Table 2.44

CLASS DISCUSSION

- What has to be done before fractions can be subtracted from one another?

____

What must I do when the denominators of two fractions that have to be

____

- What is the simplest method for calculating the difference between two mixed numbers?

____

- Which other methods can be used?

____

REMEMBER THIS!

When fractions are used in subtraction, we only subtract the numerators. The denominator is kept as it is.

REMEMBER THIS AS WELL!

If the answer is in the form of an improper fraction, it must be converted to a mixed number.

2.33.8 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.6: We know this when the learner solves problems in context, including contexts that may be used to build awareness of other Learning Areas, as well as human rights, social, economic and environmental issues such as:

1.6.2 measurements in Natural Sciences and Technology contexts.

2.34 To perform mental calculations[34]

2.34.1 MATHEMATICS

2.34.2 Common and Decimal Fractions

2.34.3 Common Fractions

2.34.4 EDUCATOR SECTION

2.34.5 Memorandum

INTRODUCTION

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[34] This content is available online at <http://cnx.org/content/m30969/1.1/>.

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1.1 $\frac{9}{5} - \frac{7}{5}$ of $1\ \frac{4}{5} - 1\ \frac{2}{5}$
1.2 $\frac{13}{6} - \frac{9}{6}$ of $2\ \frac{1}{6} - 1\ \frac{3}{6}$
1.3 $\frac{11}{7} - \frac{7}{7}$ of $1\ \frac{4}{7} - 1$

2.34.6 LEANER SECTION

2.34.7 Content

2.34.7.1 ACTIVITY: To perform mental calculations [LO 1.9.1]

1. Work with a partner. Which subtraction sums are presented on the number lines?
   1.1

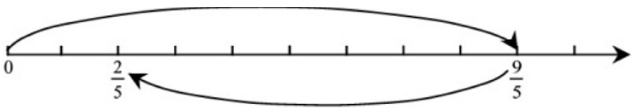

Figure 2.36

1.2

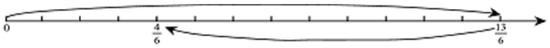

Figure 2.37

1.3

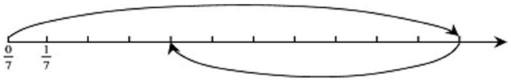

Figure 2.38

2.34.8 Assessment

Learning Outcome 1:The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.9: We know this when the learner performs mental calculations involving:

1.9.1 measurements in Natural Sciences and Technology contexts.

2.35 To calculate by selecting operations appropriate to solving problems[35]

2.35.1 MATHEMATICS

2.35.2 Common and Decimal Fractions

2.35.3 Common Fractions

2.35.4 EDUCATOR SECTION

2.35.5 Memorandum

INTRODUCTION

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OWN METHOD

- 1 $\frac{3}{8}$

1.2 3 $\frac{1}{2}$

1.3 1 $\frac{7}{10}$

1.4 2 $\frac{7}{12}$

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[35] This content is available online at <http://cnx.org/content/m30972/1.1/>.

2.35.6 LEANER SECTION

2.35.7 Content

2.35.7.1 ACTIVITY: To calculate by selecting operations appropriate to solving problems [LO 1.8.3]

Do you remember what you told one another about the subtraction of fractions during the class discussions? You should know by now that it can be done in more than one way. Calculate the following by using the method you find easiest:

1.1 $5\frac{1}{4} - 3\frac{7}{8}$

....
....
....
....

1.2 $6\frac{1}{5} - 2\frac{7}{\mathbf{10}}$

....
....
....
....

1.3 $3\frac{1}{2} - 1\frac{4}{5}$

....
....
....
....

1.4 $4\frac{5}{6} - 2\frac{1}{4}$

....
....
....
....

TIME FOR SELF-ASSESSMENT

It is very important that you have a thorough understanding of the work we have done so far. Indicate how you feel about the work by placing a tick in the appropriate block:

I can	Altogether unsure	Very unsure	Slightly unsure	Altogether sure
simplify fractions.	1	2	3	4
do addition with fractions that have denominators that are multiples of one another (e.g. $\frac{1}{2} + \frac{2}{4}$) (LO 1.8).	1	2	3	4

continued on next page

determine the smallest common multiple (common denominator) of two fractions(e.g. $\frac{1}{4} + \frac{1}{5}$) and then add them together. (LO 1.8)	1	2	3	4
calculate the sum of two mixed numbers (e.g. $3\frac{1}{2} + 2\frac{1}{4}$). (LO 1.8)	1	2	3	4
correctly subtract fractions from one another. (LO 1.8)	1	2	3	4

Table 2.45

2.35.8 Assessment

Learning Outcome 1:The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.8: We know this when the learner estimates and calculates by selecting and using operations appropriate to solving problems that involve:

1.8.3 addition and subtraction of common fractions with denominators which are multiples of each other and whole numbers with common fractions (mixed numbers).

2.36 To perform mental calculations[36]

2.36.1 MATHEMATICS

2.36.2 Common and Decimal Fractions

2.36.3 Common Fractions

2.36.4 EDUCATOR SECTION

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[36] This content is available online at <http://cnx.org/content/m30984/1.1/>.

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1.1 70
1.2 983
1.3 438
1.4 354 $\frac{1}{2}$
1.5 9
1.6 132
1.7 8
1.8 $\frac{5}{6}$
1.9 $\frac{5}{6}$
1.10 27
1.11 29
1.12 $\frac{7}{8}$
1.13 1 $\frac{1}{8}$
1.14 $\frac{3}{4}$
1.15 10 000

2.36.6 LEANER SECTION

2.36.7 Content

2.36.7.1 ACTIVITY: To perform mental calculations [LO 1.9.1, LO 1.9.2]

Complete the following mental calculation test as quickly and accurately as possible and try to improve on your previous performance!

1.1 26 + 19 + 25 = ...	1.6. 12 x 11 = ...
1.2. 1 004 – 21 = ...	1.7 56 ÷ .... = 7
1.3. Double 219:	1.8 Simplify $\mathbf{\frac{15}{21}}$:
1.4. Halve 709:	1.9 Simplify $\mathbf{\frac{25}{30}}$:
1.5. 45 ÷ .... = 5	?1.10 $\frac{3}{9} = \frac{9}{}$
?1.11 $3\frac{5}{8} = \frac{}{8}$	1.14 $1\frac{1}{2} - \frac{3}{4} = 2 - \frac{7}{8} =$
1.12 $\frac{1}{2} + \frac{3}{8} =$	1.15 $10^4 =$
1.13 $2 - \frac{7}{8} =$	

Table 2.46

I have done.. correctly!

2.36.8 Assessment

Learning Outcome 1:The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.9: We know this when the learner performs mental calculations involving:

1.9.1 addition and subtraction;

1.9.2 multiplication of whole numbers to at least 12 x 12.

2.37 To calculate by selecting operations appropriate to solving problems[37]

2.37.1 MATHEMATICS

2.37.2 Common and Decimal Fractions

2.37.3 Common Fractions

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[37] This content is available online at <http://cnx.org/content/m30985/1.1/>.

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2.37.6 LEANER SECTION

2.37.7 Content

2.37.7.1 ACTIVITY: To calculate by selecting operations appropriate to solving problems [LO 1.8.6]

1. Divide into groups of three for the following activity. Your educator will provide the necessary paper. Read the questions carefully and see if you can find the solutions to the problems. Remember to show the operations that you use.

a) A school bus can only transport one quarter of the school's 268 athletes at a time. How many passengers can fit into the bus?

b) Two thirds of the 1 944 soccer supporters were men. How many women attended the soccer game?

c) Mr Jackson wanted to save three eighths of his salary of R10 856. What amount did he save?

d) Nino wanted to buy a new cell phone that cost R4 739. He has only managed to save two sevenths of this amount. How much money does he still need to buy the phone?

e) Explain to the class how your group calculated the answers.

f) Compare your methods. How do they differ from one another?

2.37.8 Assessment

Learning Outcome 1:The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.8: We know this when the learner estimates and calculates by selecting and using operations appropriate to solving problems that involve:

1.8.6 finding fractions of whole numbers.

2.38 To use a range of strategies to check solutions[38]

2.38.1 MATHEMATICS

2.38.2 Common and Decimal Fractions

2.38.3 Common Fractions

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1. To use a range of strategies to control solution
   2. Own answer
   3. 1.1 and 1.3 ; 1.2 and 1.4

---

[38] This content is available online at <http://cnx.org/content/m30986/1.1/>.

2.38.6 LEANER SECTION

2.38.7 Content

2.38.7.1 ACTIVITY: To use a range of strategies to check solutions [LO 1.11]

2.38.7.2 To determine the equivalence and validity of different methods [LO 2.6.1, LO 2.6.3]

1. During the previous activity you might have realised that there were more than one method for calculating an answer. Now work through the different solutions for the following problem with a partner:

1.1 The first step is to determine what$\frac{1}{5}$of R200 is. I therefore divide 200 by 5:

5 200

Table 2.47

$\frac{1}{5}$is equal to R40. $\frac{4}{5}$will be R40 x 4.
He saves R160.
1.2 I first determine what $\frac{1}{5}$of R200 is. Therefore: $200 \div 5 = 40$
$\frac{1}{4} = 1 - \frac{1}{5}$I therefore subtract R40 from R200 and my answer is R160
1.3 To determine how much he saves, I have to do the following:

(1. ÷ 5) x 4

= 40 x 4
= R160
1.4 I calculate this as follows:
200 – (200 ÷ 5)
= 200 – 40
= R160
2. Which one of the above methods do you find easiest to do?
3. Which of the methods actually are exactly similar?

2.38.8 Assessment

Learning Outcome 1:The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.11: We know this when the learner uses a range of strategies to check solutions and judge the reasonableness of solutions.

Learning Outcome 2:The learner will be able to recognise, describe and represent patterns and relationships, as well as to solve problems using algebraic language and skills.

Assessment Standard 2.6: We know this when the learner determines, through discussion and comparison, the equivalence of different descriptions of the same relationship or rule presented:

2.6.1 verbally;
2.6.3 by number sentences.

2.39 To find fractions of whole numbers[39]

2.39.1 MATHEMATICS

2.39.2 Common and Decimal Fractions

2.39.3 Common Fractions

2.39.4 EDUCATOR SECTION

2.39.5 Memorandum

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COMMON AND DECIMAL FRACTIONS (LO 1; 2 AND 5)

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1.1 402

1.2 312
1.2 695
1.4 665
1.5 1,236
1.6 1,5

---

[39] This content is available online at <http://cnx.org/content/m30987/1.1/>.

2.39.5.1 BRAIN TEASER!

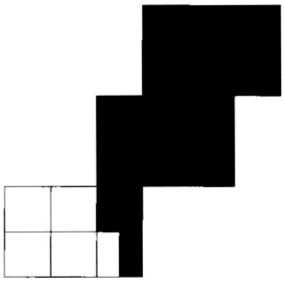

Figure 2.39

1.1
  1.2 > 1
  2.
  2.1 $\frac{1}{4}$
  2.2 $\frac{6}{25}$
  2.3 $\frac{9}{20}$
  2.4 $\frac{7}{18}$
  3.
  3.1 $\frac{6}{12}$
  3.2 $\left(\frac{4}{12}\right)$ 3.4 $\left(\frac{2}{12}\right)$
  3.3

2.39.6 LEANER SECTION

2.39.7 Content

2.39.7.1 ACTIVITY: To find fractions of whole numbers [LO 1.8.6]

1. Calculate this on your own:
  1.1 $\frac{3}{5}$of 670
  ....
  ....
  ....
  ....
  1.2 $\frac{4}{7}$of 526
  ....
  ....
  ....
  ....
  1.3 $\frac{5}{6}$ of 834
  ....
  ....
  ....

....

1.4 $\frac{5}{8}$ of 1 064

....

....

....

....

1.5 $\frac{3}{4}$ of 1,648 m

....

....

....

....

1.6 $\frac{5}{9}$ of 2,7kℓ

....

....

....

....

2.39.8 Assessment

Learning Outcome 1:The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.8: We know this when the learner estimates and calculates by selecting and using operations appropriate to solving problems that involve:

1.8.6 finding fractions of whole numbers.

2.40 To find fractions of whole numbers[40]

2.40.1 MATHEMATICS

2.40.2 Common and Decimal Fractions

2.40.3 Common Fractions

2.40.4 EDUCATOR SECTION

2.40.5 Memorandum

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COMMON AND DECIMAL FRACTIONS (LO 1; 2 AND 5)

LEARNING UNIT 1 FOCUSES ON COMMON FRACTIONS

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[40] This content is available online at <http://cnx.org/content/m30988/1.1/>.

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2.40.6 LEANER SECTION

2.40.7 Content

2.40.7.1 ACTIVITY: To find fractions of whole numbers [LO 1.8.6]

1. **BRAIN TEASER!**

1.1 Neatly colour in $\frac{3}{4}$ of the following figure:

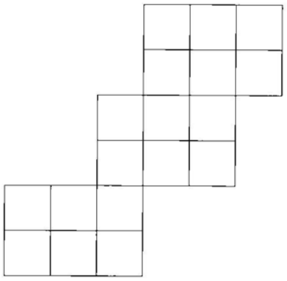


Figure 2.40

1.2 Why are you not able to colour in $\frac{3}{2}$ of the figure?

2. Supply the correct answer:

- What fraction of 60c is represented by 15c?
- What fraction of R5,00 is represented by R1,20?

- What fraction of R10 is represented by R4,50?
- What fraction of R45 is represented by R17,50?

3. Use different colours to divide the figure as follows:
   3.1 two equal parts (blue)
   3.2 three equal parts (green)
   3.3 four equal parts (purple)
   3.4 six equal parts (orange)

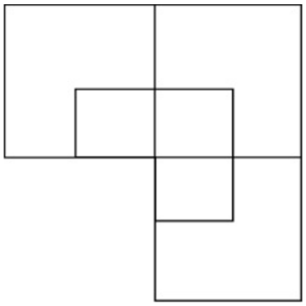
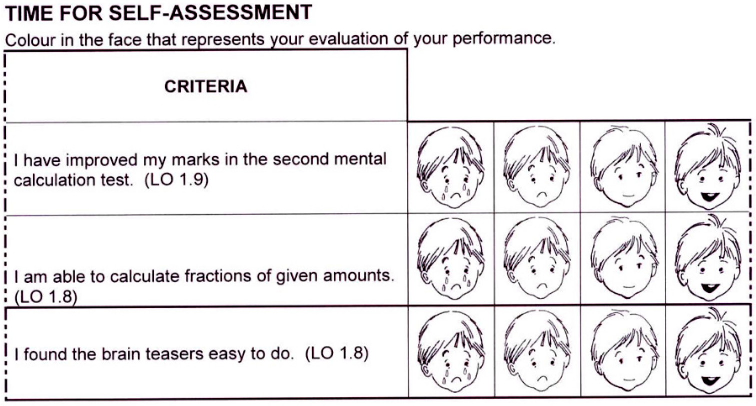


Figure 2.41



TIME FOR SELF-ASSESSMENT

Colour in the face that represents your evaluation of your performance.

CRITERIA				
I have improved my marks in the second mental calculation test. (LO 1.9)				
I am able to calculate fractions of given amounts. (LO 1.8)				
I found the brain teasers easy to do. (LO 1.8)				

Figure 2.42

2.40.8 Assessment

Learning Outcome 1:The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.8: We know this when the learner estimates and calculates by selecting and using operations appropriate to solving problems that involve:

1.8.6 finding fractions of whole numbers.

2.41 To record data[41]

2.41.1 MATHEMATICS

2.41.2 Common and Decimal Fractions

2.41.3 Common Fractions

2.41.4 EDUCATOR SECTION

2.41.5 Memorandum

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[41] This content is available online at <http://cnx.org/content/m30989/1.1/>.

2.41.6 LEANER SECTION

2.41.7 Content

2.41.7.1 ACTIVITY: To record data [LO 5.1, LO 5.2, LO 5.4]

2.41.7.2 To draw graphs and interpret data [LO 5.6]

** This activity is for inclusion in your portfolio. Work neatly and consider the assessment grid before you start.

1. Find out at home what fraction of your parents' income is spent on:
   1.1 food:
   1.2 housing:
   1.3 electricity and water:
   1.4 telephone:
   1.5 motor car/s:

- recreation (eating out, cinema, etc.):

2. Draw a table and represent the above information as neatly as possible.
3. Now draw a pie chart to show this information:

2.41.7.2.1 ASSESSMENT: SALARY AND FRACTIONS

1. = not at all
2. = just a little
3. = good

4 = outstanding

CRITERIA	CODE			
	1	2	3	4
Completeness	Hardly any of the instructions have been carried out.	Half of the instructions have been carried out	One instruction has not been carried out.	All instructions have been carried out.
Table	This was not done at all.	It has been done but many errors occur and it is incomplete.	One or two errors occur.	It has been neatly and correctly done.
Graph	This was not done at all.	It has been done but many errors occur and it is incomplete.	One or two errors occur.	It has been neatly and correctly done.

Table 2.48

2.41.8 Assessment

Learning Outcome 5:The learner will be able to collect, summarise, display and critically analyse data in order to draw conclusions and make predictions, and to interpret and determine chance variation.

Assessment Standard 5.1: We know this when the learner poses simple questions about school and family environment, and identifies appropriate data sources in order to address human rights, social, political, cultural, environmental and economic issues in that environment;

Assessment Standard 5.2: We know this when the learner uses simple data collection sheets (requiring tallies) and simple questionnaires (with yes/no type responses) in order to collect data (alone and/or as a member of a group or team) to answer questions posed by the teacher, class and self;

Assessment Standard 5.4: We know this when the learner organises and records data, using tallies and tables;

Assessment Standard 5.6: We know this when the learner draws a variety of graphs by hand/technology to display and interpret data (grouped and ungrouped).

2.42 Test[42]

2.42.1 MATHEMATICS

2.42.2 Common and Decimal Fractions

2.42.3 Common Fractions

2.42.4 EDUCATOR SECTION

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- LEARNING UNIT 2 FOCUSES ON DECIMAL FRACTIONS

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[42] This content is available online at <http://cnx.org/content/m30990/1.1/>.

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TEST 1

1. Fill in the missing words:

1.1 Improper
1.2 Mixed number
2.1 $\frac{20}{28}$ 2.2 $\frac{5}{6}$
3. Fill in: $<$; $>$ or $=$:
3.1 $=$ 3.2 $>$
4. Simplify:
4.1 $\frac{16}{19}$ 4.2 $\frac{3}{4}$
5. Calculate:
5.1 $= 10\ \frac{2}{3} + \frac{5}{9}$ 5.2 1 $\frac{7}{8}$
$= 10\ \frac{11}{9}$
5.3 2 476
6.$x = \frac{1}{6} + \frac{4}{9}$
$= +$
$x =$
7. $y = \frac{3}{5}$ x $\frac{1025}{1}$
= 615 km

2.42.6 LEANER SECTION

2.42.7 Content

2.42.7.1 TEST 1

1. Fill in the missing words:

1.1 $\mathbf{\frac{16}{7}}$is known as a ………………….......................... fraction.
1.2 We refer to $1\frac{4}{7}$as a .... (2)

2. Fill in the missing numbers:

2.1 $\frac{5}{7} = \frac{\mathbf{20}}{}$2.2 $\frac{\mathbf{35}}{\mathbf{42}} = \frac{}{6}$
(2)

3. Fill in: $<$; $>$ or $=$:

3.1 $\frac{16}{20}$ .... $\frac{4}{5}$ 3.2 $\frac{4}{5}$ .... $\frac{3}{4}$
(2)

4. Simplify:

4.1 $\frac{32}{38}$ 4.2 $\frac{45}{60}$
(2)

5. Calculate:

5.1 $7\frac{2}{3} + 3\frac{5}{9}$
(3)
5.2 $6\frac{1}{2} - 4\frac{5}{8}$
(3)
5.3 $\frac{4}{5}$ of 3 095

(3)

6. Janine saves one sixth of her pocket money and Zade saves four ninths of his. What is the combined fraction of their saved pocket money?

(4)

7. Dad has to travel 1 025 km. He only completes three fifths of the distance. How many km has he travelled?

(4)

2.43 To recognise the place values of digits[43]

2.43.1 MATHEMATICS

2.43.2 Common and Decimal Fractions

2.43.3 Common Fractions

2.43.4 EDUCATOR SECTION

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HOW WELL DO YOU REMEMBER THIS?

- decimals
- comma
- tenths
- second
- thousand
- point

1. 300
2. $\frac{7}{10}$
3. $\frac{9}{1000}$
4. $\frac{5}{100}$

2.43.6 LEANER SECTION

2.43.7 Content

2.43.7.1 HOW WELL DO YOU REMEMBER THIS?

You have already come into contact with decimal fractions in Grades 4 and 5. Let's see how much you remember!

Find the answers in the grid and circle them neatly:

- 0,89 is referred to as a fraction.
- The decimal separates whole numbers.
- The first figure/digit following the comma represents .
- The figure/digit after the comma represents hundredths.
- The third figure/digit after the comma represents…………………………………..ths.
- On a pocket calculator, the decimal comma is shown by means of a .

C	B	T	Y	W	K	O	P	T
O	D	E	C	I	M	A	L	P
M	D	N	S	I	M	A	L	E
M	G	T	F	Y	M	O	E	E
A	T	H	L	J	A	K	L	D
R	Y	S	E	C	O	N	D	E
T	U	T	J	P	U	N	T	J
V	O	B	L	P	O	I	N	T
T	H	O	U	S	A	N	D	A
W	Y	S	H	O	E	D	G	F

Table 2.49

LET'S DO REVISION!

2.43.7.2 ACTIVITY: To recognise the place values of digits [LO 1.4.2]

It is important to know the value of each digit in a decimal number to be able to perform calculations correctly when working with decimal fractions. Let's see whether you are able to do these correctly, describing the value of the underlined digits.

1. 326,43
2. 48,796

1. 86,549

4. 296,85

2.43.8 Assessment

Learning Outcome 1:The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.4: We know this when the learner recognises the place value of digits in:

1.4.2 decimal fractions to at least 2 decimal places.

2.44 To recognise and classify numbers in order to describe and compare them[44]

2.44.1 MATHEMATICS

2.44.2 Common and Decimal Fractions

2.44.3 Common Fractions

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[44] This content is available online at <http://cnx.org/content/m30996/1.1/>.

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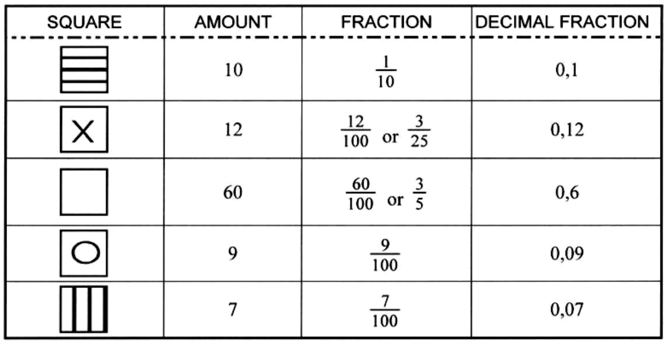


SQUARE	AMOUNT	FRACTION	DECIMAL FRACTION
▤	10	$\frac{1}{10}$	0,1
☒	12	$\frac{12}{100}$ or $\frac{3}{25}$	0,12
☐	60	$\frac{60}{100}$ or $\frac{3}{5}$	0,6
⧇	9	$\frac{9}{100}$	0,09
▥	7	$\frac{7}{100}$	0,07

Figure 2.43

2.44.6 LEANER SECTION

2.44.7 Content

2.44.7.1 ACTIVITY: To recognise and classify numbers in order to describe and compare them [LO 1.4.2]

In Grade 5 you learned to write fractions as decimal fractions. Take a good look at the following and then complete the table:

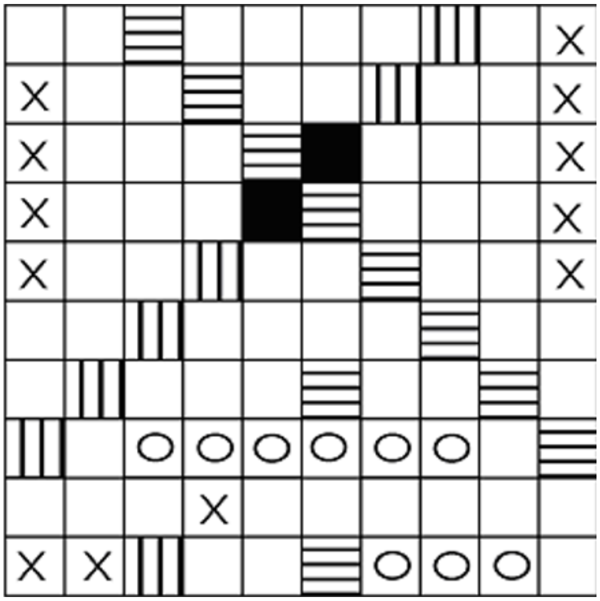
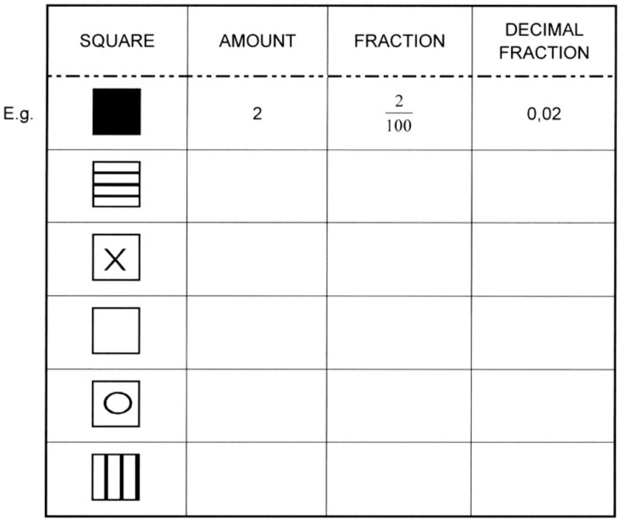


Figure 2.44



	SQUARE	AMOUNT	FRACTION	DECIMAL FRACTION
E.g.	■	2	$\frac{2}{100}$	0,02
	▤			
	☒			
	☐			
	○			
	▥			

Figure 2.45

2.44.8 Assessment

Learning Outcome 1:The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.4: We know this when the learner recognises the place value of digits in:

1.4.2 decimal fractions to at least 2 decimal places.

2.45 To use a range of techniques to perform calculations[45]

2.45.1 MATHEMATICS

2.45.2 Common and Decimal Fractions

2.45.3 Common Fractions

2.45.4 EDUCATOR SECTION

2.45.5 Memorandum

INTRODUCTION

The learning programme for grade six consists of five modules:

1. Number concept, Addition and Subtraction
2. Multiplication and Division
3. Fractions and Decimal fractions
4. Measurement and Time
5. Geometry; Data handling and Probability

- It is important that educators complete the modules in the above sequence, as the learners will require the knowledge and skills acquired through a previous module to be able to do the work in any subsequent module.

COMMON AND DECIMAL FRACTIONS (LO 1; 2 AND 5)

LEARNING UNIT 1 FOCUSES ON COMMON FRACTIONS

- This module continues the work dealt with in grade 5. Addition and subtraction of fractions are extended and calculation of a fraction of a particular amount is revised.
- Check whether the learners know the correct terminology and are able to use the correct strategies for doing the above correctly.
- Critical outcome 5 (Communicating effectively by using visual, symbolic and /or language skills in a variety of ways) is addressed.
- It should be possible to work through the module in 3 weeks.
- ** Activity 17 is designed as a portfolio task. It is a very simple task, but learners should do it neatly and accurately. They must be informed in advance of how the educator will be assessing the work.

- LEARNING UNIT 2 FOCUSES ON DECIMAL FRACTIONS
- This module extends the work that was done in grade 5. Learners should be able to do rounding of decimal fractions to the nearest tenth, hundredth and thousandth. Emphasise the use of the correct method (vertical) for addition and subtraction. Also spend sufficient time on the multiplication and division of decimal fractions.
- As learners usually have difficulty with the latter, you could allow 3 to 4 weeks for this section of the work.

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[45] This content is available online at <http://cnx.org/content/m30998/1.1/>.

- ** Activity 19 is a task for the portfolio. The assignment is fairly simple, but learners should complete it neatly and accurately. They must be informed in advance of how the educator will be assessing the work.

1.1 $8 + \frac{4}{10} + \frac{7}{100} + \frac{2}{1000}$
1.2 $10 + 3 + \frac{8}{10} + \frac{3}{100}$
1.3 $400 + 20 + 6 + \frac{9}{10}$
2.
2.1 204,35
2.2 21,739
2.3 20,405
2.4 32.041

2.45.6 LEANER SECTION

2.45.7 Content

2.45.7.1 ACTIVITY: To use a range of techniques to perform calculations [LO 1.10.3]

1. If you are able to recognise the place values of the different digits (see Activity 2.1), the following activity should be child's play for you! Look carefully at each digit in the following numbers and then write them in extended notation:

- 8,472:
- 13,83:
- 426,9:

2. What number is represented below?

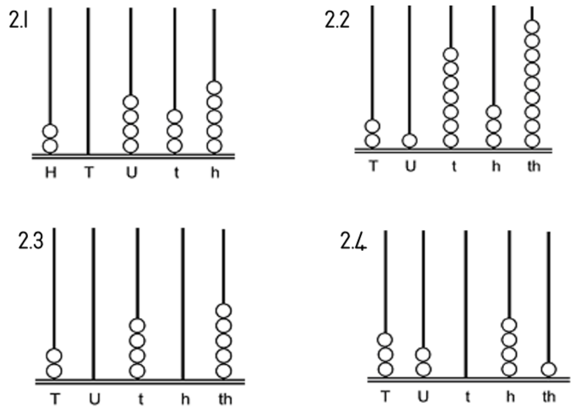

Figure 2.46

2.45.8 Assessment

Learning Outcome 1:The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.10: We know this when the learner uses a range of techniques to perform written and mental calculations with whole numbers including:

1.10.3 building up and breaking down numbers.

2.46 To recognise and classify numbers in order to describe and compare them[46]

2.46.1 MATHEMATICS

2.46.2 Common and Decimal Fractions

2.46.3 Common Fractions

2.46.4 EDUCATOR SECTION

2.46.5 Memorandum

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COMMON AND DECIMAL FRACTIONS (LO 1; 2 AND 5)

LEARNING UNIT 1 FOCUSES ON COMMON FRACTIONS

- This module continues the work dealt with in grade 5. Addition and subtraction of fractions are extended and calculation of a fraction of a particular amount is revised.
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- It should be possible to work through the module in 3 weeks.
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- LEARNING UNIT 2 FOCUSES ON DECIMAL FRACTIONS
- This module extends the work that was done in grade 5. Learners should be able to do rounding of decimal fractions to the nearest tenth, hundredth and thousandth. Emphasise the use of the correct method (vertical) for addition and subtraction. Also spend sufficient time on the multiplication and division of decimal fractions.

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[46] This content is available online at <http://cnx.org/content/m30999/1.1/>.

- As learners usually have difficulty with the latter, you could allow 3 to 4 weeks for this section of the work.

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1,35 1,53 1,77 2,09

2.46.6 LEANER SECTION

2.46.7 Content

2.46.7.1 ACTIVITY: To recognise and classify numbers in order to describe and compare them [LO 1.3.2]

1. You already know that number lines help us see where specific numbers fit in. Look carefully at the number lines and neatly write down the numbers that have been left out:

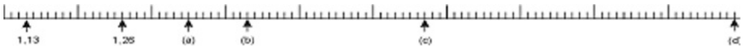

Figure 2.47

2.46.8 Assessment

Learning Outcome 1:The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.3: We know this when the learner recognises and represents the following numbers in order to describe and compare them:

1.3.2 decimal fractions to at least two decimal places.

2.47 To recognise and classify numbers in order to describe and compare them[47]

2.47.1 MATHEMATICS

2.47.2 Common and Decimal Fractions

2.47.3 Common Fractions

2.47.4 EDUCATOR SECTION

2.47.5 Memorandum

INTRODUCTION

The learning programme for grade six consists of five modules:

1. Number concept, Addition and Subtraction
2. Multiplication and Division

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[47] This content is available online at <http://cnx.org/content/m31001/1.1/>.

3. Fractions and Decimal fractions
4. Measurement and Time
5. Geometry; Data handling and Probability

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COMMON AND DECIMAL FRACTIONS (LO 1; 2 AND 5)
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COMMON FRACTION	$\frac{1}{2}$	$\frac{1}{4}$	$\frac{3}{4}$	$\frac{4}{5}$	$\frac{1}{8}$	$\frac{4}{20}$	$\frac{3}{8}$	$\frac{5}{8}$
DECIMAL FRACTION	0,5	0,25	0,75	0,8	0,125	0,2	0,375	0,625

Table 2.50

BRAIN TEASER

- 0,6 repeating
- 0,16 (6 repeating)
- 0,1 repeating

2.47.6 LEANER SECTION

2.47.7 Content

2.47.7.1 ACTIVITY: To recognise and classify numbers in order to describe and compare them [LO 1.3.2, LO 1.3.3]

1. A last bit of revision! Write the common fractions as decimal fractions and vice versa. Remember to complete the table neatly!

COMMON FRACTION		$\frac{1}{4}$		$\frac{4}{5}$				
DECIMAL FRACTION	0,5		0,75		0,125			0,625

Table 2.51

2.47.7.1.1 BRAIN TEASER!

Write the following as a decimal fraction – remember to use **brief** notation!

$\frac{2}{3}$

$\frac{1}{6}$

$\frac{1}{9}$

2.47.8 Assessment

Learning Outcome 1:Die leerder is in staat om getalle en die verwantskappe daarvan te herken, te beskryf en voor te stel, en om tydens probleemoplossing bevoeg en met selfvertroue te tel, te skat, te bereken en te kontroleer.

Assessment Standard 1.3: We know this when the learner recognises and represents the following numbers in order to describe and compare them:

1.3.2 decimal fractions to at least two decimal places;

1.3.3 common fractions, including specifically tenths, hundreds and percentages.

2.48 To perform mental calculations[48]

2.48.1 MATHEMATICS

2.48.2 Common and Decimal Fractions

2.48.3 Common Fractions

2.48.4 EDUCATOR SECTION

2.48.5 Memorandum

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COMMON AND DECIMAL FRACTIONS (LO 1; 2 AND 5)

LEARNING UNIT 1 FOCUSES ON COMMON FRACTIONS

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[48] This content is available online at <http://cnx.org/content/m31006/1.1/>.

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- This module extends the work that was done in grade 5. Learners should be able to do rounding of decimal fractions to the nearest tenth, hundredth and thousandth. Emphasise the use of the correct method (vertical) for addition and subtraction. Also spend sufficient time on the multiplication and division of decimal fractions.
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1.1 45
1.2 18
1.3 1 984
1.4 8
1.5 10
1.6 12
1.7 45

- 9

1.9 7
1.10 7
1.11 8
1.12 125
1.13 3
1.14 $\frac{75}{100}$
1.15 $\frac{93}{100}$

2.48.6 LEANER SECTION

2.48.7 Content

2.48.7.1 ACTIVITY: To perform mental calculations [LO 1.9]

1. Are you able to complete the following mental calculation test in three minutes?

1.1 19 + 15 + 11 = ...	1.7 .... ÷ 9 = 5
1.2. 35 – 17 = ...	1.8 36 ÷ = 4
1.3. 2 003 – 19 = ...	1.9 35 ÷ 5 =
1.4. 9 x .... = 72	1.10 (4 x 7) + = 35
1.5. .... x 5 = 50	1.11 (5 x) – 9 = 31
1.6 7 x .... = 84	1.12 $\frac{1}{8}$ = 0,
1.13 $\frac{6}{20}$ = 0,	1.15 2,93 = 2
1.14 1,75 = 1	

Table 2.52

Ek het reg!

2.48.8 Assessment

Learning Outcome 1:The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.9: We know this when the learner performs mental calculations.

2.49 To count forwards and backwards in decimal fractions[49]

2.49.1 MATHEMATICS

2.49.2 Common and Decimal Fractions

2.49.3 Common Fractions

2.49.4 EDUCATOR SECTION

2.49.5 Memorandum

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COMMON AND DECIMAL FRACTIONS (LO 1; 2 AND 5)

LEARNING UNIT 1 FOCUSES ON COMMON FRACTIONS

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[49] This content is available online at <http://cnx.org/content/m31014/1.1/>.

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2.49.6 LEANER SECTION

2.49.7 Content

2.49.7.1 ACTIVITY: To count forwards and backwards in decimal fractions [LO 1.1]

2.49.7.1.1 Let's count!

1. You'll need a partner and a pocket calculator. Take turns. One partner has to count out loud while the other one refers to the calculator to check. (Remember that the calculator has to be programmed first!)

Count in intervals of:
1.1 0,1 from 10 to 0.
1.2 0,2 from 5,4 to 10,6.
1.3 0,04 from 0 to 0,48.
1.4 0,01 from 7 to 6,88.
1.5 0,003 from 0 to 0,036.
1.6 0,001 from 5 to 4,985.

2.49.8 Assessment

Learning Outcome 1:The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.1: We know this when the learner counts forwards and backwards in decimals.

2.50 To investigate and extend numerical patterns[50]

2.50.1 MATHEMATICS

2.50.2 Common and Decimal Fractions

2.50.3 Common Fractions

2.50.4 EDUCATOR SECTION

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1.1 0,0009 ; 0,01 ; 0,011 ; 0,021
1.2 0,024 ; 0,023 ; 0,022 ;
1.3 0,75 ; 1 ; 1,25 ; 1,5
1.4 0,015 ; 0,02 ; 0,025 ; 0,03
1.5 4,25 ; 4 ; 3,75 ; 3,5
1.6 2,65 ; 2,475 ; 2,3 ; 2,125

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[50] This content is available online at <http://cnx.org/content/m31015/1.1/>.

2.50.6 LEANER SECTION

2.50.7 Content

2.50.7.1 ACTIVITY: To investigate and extend numerical patterns [LO 2.1.2]

1. Take a careful look at the following numbers. Say each out loud. Then try to see the pattern. If you are able to do it, complete the number patterns in writing without using your pocket calculator. Ask your educator for assistance if you struggle to do it:

1.1 0,007; 0,008; ....; ....; ....; ....

- 0,026; 0,025; ....; ....; ....; ....

1.3 0,25; 0,5; ....; ....; ....; ....
1.4 0,005; 0,010; ....; ....; ....; ....
1.5 4,75; 4,5; ....; ....; ....; ....
1.6 3; 2,825; ....; ....; ....; ....
2. Check your answers with the help of a pocket calculator.

2.50.8 Assessment

Learning Outcome 2:The learner will be able to recognise, describe and represent patterns and relationships, as well as to solve problems using algebraic language and skills.

Assessment Standard 2.1: We know this when the learner investigates and extends numeric and geometric patterns looking for a relationship or rules, including patterns:

2.1.2 investigates and extends numeric and geometric patterns looking for a relationship or rules, including patterns.

2.51 To recognise and classify numbers in order to describe and compare them[51]

2.51.1 MATHEMATICS

2.51.2 Common and Decimal Fractions

2.51.3 Common Fractions

2.51.4 EDUCATOR SECTION

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[51] This content is available online at <http://cnx.org/content/m31017/1.1/>.

COMMON AND DECIMAL FRACTIONS (LO 1; 2 AND 5)

LEARNING UNIT 1 FOCUSES ON COMMON FRACTIONS

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- LEARNING UNIT 2 FOCUSES ON DECIMAL FRACTIONS
- This module extends the work that was done in grade 5. Learners should be able to do rounding of decimal fractions to the nearest tenth, hundredth and thousandth. Emphasise the use of the correct method (vertical) for addition and subtraction. Also spend sufficient time on the multiplication and division of decimal fractions.
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1.1 False
1.2 True
1.3 False
1.4 False
1.5 True
1.6 True
1.7 True
1.8 False
1.9 False
1.10 True

2.51.6 LEANER SECTION

2.51.7 Content

2.51.7.1 ACTIVITY: To recognise and classify numbers in order to describe and compare them [LO 1.3.2]

2.51.7.1.1 COMPETITION TIME!

1. Form groups of four. You are allowed one minute only to decide whether each of the following is true or false. Your educator will then provide the correct answer.

1.1 $0{,}1 < 0{,}02$
1.2 $1 > 0{,}99$
1.3 $0{,}4 < 0{,}06$
1.4 $0{,}3 < 0{,}30$
1.5 $0{,}7 > 0{,}071$
1.6 $1{,}04 = 1{,}040$
1.7 $0{,}49 < 0{,}5$
1.8 $0{,}042 > 0{,}42$

1.9 0,057 < 0,13
1.10 3,8 = 3,800

- Which group has won? ……………………………………………………………

How many answers did YOUR group get right? ………………………………

TIME FOR SELF-ASSESSMENT

It is very important that you understand and feel that you are in control concerning the work we have done so far. Show us how you feel about it by assessing yourself on a scale of 1 - 4. Read the criteria and circle the appropriate number:

1 = needs attention (struggling)
2 = fairly good (coping)3 = very good (fairly confident)
4 = outstanding (fully confident)

CRITERIA	CODE			
I was able to find the correct answer on p. 27.	1	2	3	4
I am able to name the value of the underlined digit in a number.	1	2	3	4
I am able to write fractions as decimal fractions.	1	2	3	4
I am able to write decimal numbers in extended notation.	1	2	3	4
I am able to take readings from a number line and write them down correctly (LO 1.3)	1	2	3	4
I am able to write decimal fractions as common fractions. (LO 1.3)	1	2	3	4

continued on next page

I am able to programme my pocket calculator to count in decimal intervals. (LO 1.10)	1	2	3	4
I am able to count on in decimal intervals. (LO 1.1)	1	2	3	4
I am able to count backwards in decimal intervals. (LO 1.1)				
I am able to correctly compare fractions with one another and to fill in the correct relationship signs.	1	2	3	4

Table 2.53

2.51.8 Assessment

Learning Outcome 1:The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.3: We know this when the learner recognises and represents the following numbers in order to describe and compare them:

1.3.2 decimal fractions to at least two decimal places.

2.52 To use a range of techniques to perform calculations[52]

2.52.1 MATHEMATICS

2.52.2 Common and Decimal Fractions

2.52.3 Common Fractions

2.52.4 EDUCATOR SECTION

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[52] This content is available online at <http://cnx.org/content/m31029/1.1/>.

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1.2 a) 6,4
b) 2,6
c) 1
d) 5,3
e) 4,3
f) 3,9
1.3 thousandths
hundredth a hundredth
1.4 0,261 = 0,26
0,935 = 0,94
3,478 = 3,48
0,955 = 0,96
4,227 = 4,23
2,132 = 2,13
BRAIN TEASER!
1.5 a) 4,263
b) 5,145
c) 2,512
d) 6,329
e) 1,835
f) 3,490

2.52.6 LEANER SECTION

2.52.7 Content

2.52.7.1 ACTIVITY: To use a range of techniques to perform calculations [LO 1.10.4]

ROUNDING:

1. Take a good look at these newspaper headlines:

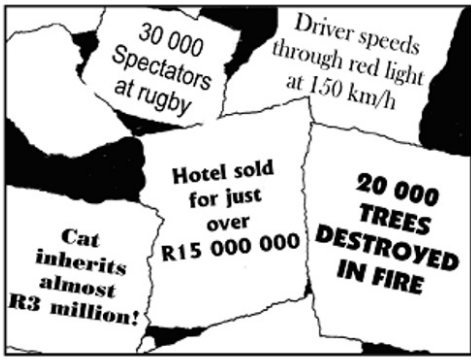
30 000 Spectators at rugby
Driver speeds through red light at 150 km/h
Hotel sold for just over R15 000 000
20 000 TREES DESTROYED IN FIRE
Cat inherits almost R3 million!

Figure 2.48

These numbers have all been rounded. Let's see how decimal numbers can be rounded!

1.1 Work with a friend to examine the following flow chart. Be sure that you understand what it tells you. Then explain it to the rest of the class.

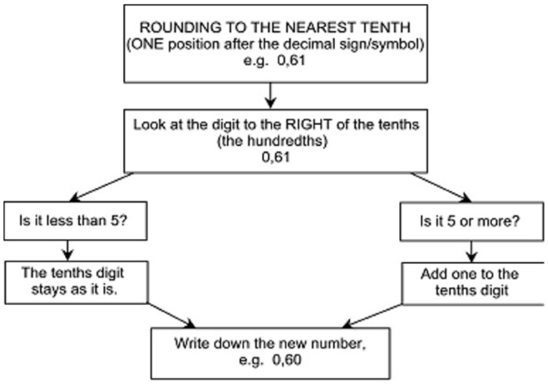
ROUNDING TO THE NEAREST TENTH (ONE position after the decimal sign/symbol) e.g. 0,61
Look at the digit to the RIGHT of the tenths (the hundredths) 0,61
Is it less than 5?
Is it 5 or more?
The tenths digit stays as it is.
Add one to the tenths digit
Write down the new number, e.g. 0,60

Figure 2.49

1.2 Round the following off to one position after the decimal comma (one tenth):

a) 6,39
b) 2,64
c) 0,99
d) 5,329
e) 4,261
f) 3,883

1.3 Work with a friend to see whether you are able to fill in the missing words!

E.g.

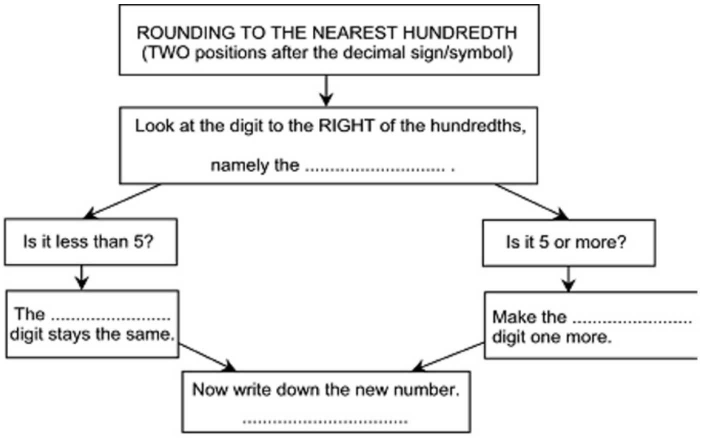
ROUNDING TO THE NEAREST HUNDREDTH
(TWO positions after the decimal sign/symbol)
Look at the digit to the RIGHT of the hundredths, namely the ....
Is it less than 5?
Is it 5 or more?
The .... digit stays the same.
Make the .... digit one more.
Now write down the new number. ....

Figure 2.50

1.4 Round the following to the nearest hundredth (two positions after the decimal comma) and link each with its rounded off partner.

E.g.

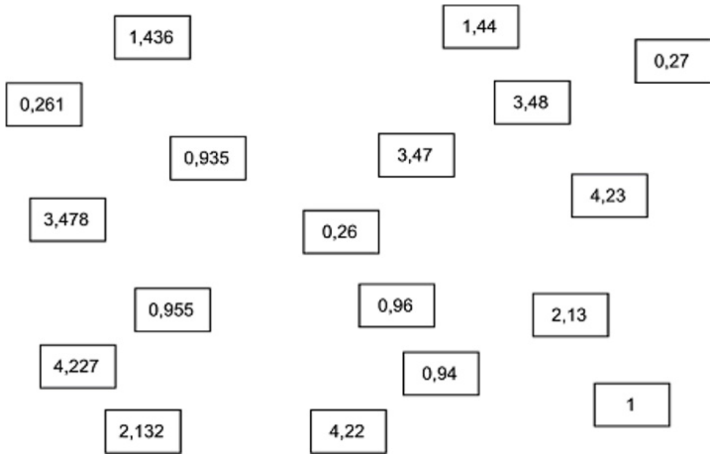

Figure 2.51

1.5. **BRAIN TEASER!**

Are you able to round off the following to the nearest thousandths? (three positions after the decimal comma)

a) 4,2634
b) 5,1447
c) 2,5121
d) 6,3286
e) 1,8353
f) 3,4895

2.52.8 Assessment

Learning Outcome 1:The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.10: We know this when the learner uses a range of techniques to perform written and mental calculations with whole numbers including:

1.10.4 rounding off and compensating.

2.53 To recognise and use equivalent forms of decimal fractions[53]

2.53.1 MATHEMATICS

2.53.2 Common and Decimal Fractions

2.53.3 Common Fractions

2.53.4 EDUCATOR SECTION

2.53.5 Memorandum

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The learning programme for grade six consists of five modules:

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4. Measurement and Time
5. Geometry; Data handling and Probability

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COMMON AND DECIMAL FRACTIONS (LO 1; 2 AND 5)

LEARNING UNIT 1 FOCUSES ON COMMON FRACTIONS

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- Check whether the learners know the correct terminology and are able to use the correct strategies for doing the above correctly.
- Critical outcome 5 (Communicating effectively by using visual, symbolic and /or language skills in a variety of ways) is addressed.
- It should be possible to work through the module in 3 weeks.
- ** Activity 17 is designed as a portfolio task. It is a very simple task, but learners should do it neatly and accurately. They must be informed in advance of how the educator will be assessing the work.

- LEARNING UNIT 2 FOCUSES ON DECIMAL FRACTIONS
- This module extends the work that was done in grade 5. Learners should be able to do rounding of decimal fractions to the nearest tenth, hundredth and thousandth. Emphasise the use of the correct method (vertical) for addition and subtraction. Also spend sufficient time on the multiplication and division of decimal fractions.
- As learners usually have difficulty with the latter, you could allow 3 to 4 weeks for this section of the work.

** Activity 19 is a task for the portfolio. The assignment is fairly simple, but learners should complete it neatly and accurately. They must be informed in advance of how the educator will be assessing the work.

2.1 =
2.2 <
2.3 <
2.4 <
2.5 =

---

[53] This content is available online at <http://cnx.org/content/m31036/1.1/>.

2.6 =
2.7 <
2.8 <
2.9 <
2.10 <

2.53.6 LEANER SECTION

2.53.7 Content

2.53.7.1 ACTIVITY: To recognise and use equivalent forms of decimal fractions [LO 1.5.2]

ARRANGEMENT OF DECIMAL AND COMMON FRACTIONS

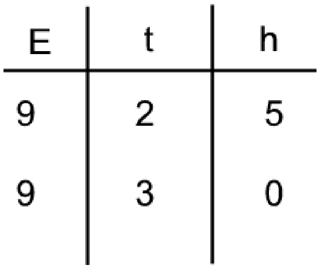
Earlier in the module you had to decide whether relationship signs were filled in correctly. Work with a friend to examine the following question and the solutions::

1. Two painters wanted to know who was painting the longer wall: one wall measured 9,3 m and the other $9\frac{1}{4}$ m.

x 4

- x 4 I work it out like this: $9{,}3 = 9\frac{3}{10}\frac{3}{10} = \frac{12}{40}$

x 10 $9\frac{3}{10} = 9\frac{12}{40}$
x 10 $9\frac{1}{4} = 9\frac{10}{40}\frac{1}{4} = \frac{10}{40}$
The 9,3 m wall is longer.



E	t	h
9	2	5
9	3	0

Figure 2.52

1.2 I first change the $9\frac{1}{4}$ m to a decimal fraction.
x 25x 25 $9\frac{1}{4} = \frac{1}{4} = \frac{25}{100}$
9,3 =
Whose method do you prefer?

- Why?

....
....
....
....

2. **ANOTHER COMPETITION!**

This time the girls are competing against the boys! You now have two minutes to fill in the correct relationship sign. Your educator will then ask any boy or girl to read out the right answers.

2.1 0,09 $\frac{9}{100}$
2.2 4,02 $4\frac{2}{5}$
2.3 0,016 $\frac{16}{100}$
2.4 0 0,8
2.5 0,20 . $\frac{1}{5}$
2.6 1,4 $1\frac{8}{20}$
2.7 3 $\frac{210}{1000}$ 3,22
2.8 0,494 $\frac{1}{2}$
2.9 2,006 $2\frac{6}{100}$
2.10 0,025 $\frac{1}{4}$

- Who has won this time?
- How many of your answers are correct?

2.53.8 Assessment

Learning Outcome 1:The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.5: We know this when the learner recognises and uses equivalent forms of the numbers listed above, including:

1.5.2 decimal fractions to at least 2 decimal places.

2.54 To calculate by selecting operations appropriate to solving problems[54]

2.54.1 MATHEMATICS

2.54.2 Common and Decimal Fractions

2.54.3 Common Fractions

2.54.4 EDUCATOR SECTION

2.54.5 Memorandum

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COMMON AND DECIMAL FRACTIONS (LO 1; 2 AND 5)

LEARNING UNIT 1 FOCUSES ON COMMON FRACTIONS

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[54] This content is available online at <http://cnx.org/content/m31037/1.1/>.

- This module continues the work dealt with in grade 5. Addition and subtraction of fractions are extended and calculation of a fraction of a particular amount is revised.
- Check whether the learners know the correct terminology and are able to use the correct strategies for doing the above correctly.
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- LEARNING UNIT 2 FOCUSES ON DECIMAL FRACTIONS
- This module extends the work that was done in grade 5. Learners should be able to do rounding of decimal fractions to the nearest tenth, hundredth and thousandth. Emphasise the use of the correct method (vertical) for addition and subtraction. Also spend sufficient time on the multiplication and division of decimal fractions.
- As learners usually have difficulty with the latter, you could allow 3 to 4 weeks for this section of the work.

** Activity 19 is a task for the portfolio. The assignment is fairly simple, but learners should complete it neatly and accurately. They must be informed in advance of how the educator will be assessing the work.

1.1 15,549
1.2 23,866
1.3 25,909
1.4 121,301
1.5 149,869

2.54.6 LEANER SECTION

2.54.7 Content

2.54.7.1 ACTIVITY: To calculate by selecting operations appropriate to solving problems [LO 1.8.8]

1. Complete the table:

	CALCULATION	ESTIMATION	POCKET CALCULATOR ANSWER
E.g.	1,8 + 3,026	2 + 3 = 5	4,826
1.1	3,049 + 12,5		
1.2	9,876 + 13,99		
1.3	0,009 + 25,9		

Table 2.54

2.54.7.1.1 ADDITION AND SUBTRACTION

DO YOU KNOW THIS?

When we have to add or subtract decimal fractions, it is wise to first estimate the answer by rounding off to the nearest whole number.

2.54.8 Assessment

Learning Outcome 1:The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.8: We know this when the learner estimates and calculates by selecting and using operations appropriate to solving problems that involve:

1.8.8 addition and subtraction of positive decimals with at least 2 decimal places.

2.55 To calculate by selecting operations appropriate to solving problems[55]

2.55.1 MATHEMATICS

2.55.2 Common and Decimal Fractions

2.55.3 Common Fractions

2.55.4 EDUCATOR SECTION

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[55] This content is available online at <http://cnx.org/content/m31038/1.1/>.

- As learners usually have difficulty with the latter, you could allow 3 to 4 weeks for this section of the work.

** Activity 19 is a task for the portfolio. The assignment is fairly simple, but learners should complete it neatly and accurately. They must be informed in advance of how the educator will be assessing the work.

1. 165,2 ℓ
2. 372,564
3. 56,42 kg
4. 147,431 m
5. and 6. Own explanation

2.55.6 LEANER SECTION

2.55.7 Content

2.55.7.1 ACTIVITY: To calculate by selecting operations appropriate to solving problems [LO 1.8.8]

You have to work in groups of three for the following activity. Ask the educator for the paper that you will need. Read through the problems attentively and try to find the answers. Remember to show the operations that you use!

1. Mr Katlego has had to put petrol into his minibus on three occasions this month, to transport passengers. He first put in 59,81 litres, then 48,65 litres and finally another 56,75 litres. How many litres of petrol have been put into his minibus this month?

2. What is the difference between 900 and 527,436?

3. Didi was very overweight and decided to take action. Before dieting, she weighed 143,21 kg. After a few months she weighed 86,79 kg. How many kg has Didi lost?

4. Mr Naidoo has decided to take his class to the game park. The following interesting information was derived from this visit:

10 animals	Length/Height
ZebrasGiraffesOstrichesElephantsHippopotamuses	15,3m56,08m23,158m38m14,893m

Table 2.55

If you stacked all these animals on top of one another, how high would they be?

5. Explain to the rest of the class how your group calculated the answers.

6. Compare your methods. How do they differ from one another?

TIME FOR SELF-ASSESSMENT

Assess your work on a scale of 1 - 4 by circling the appropriate number:

1 = not at all
2 = just a little
3 = good
4 = outstanding

CRITERIA	CODE			
All group members participated in the activity.	1	2	3	4
Group members listened to one another.	1	2	3	4
Group members helped and encouraged each other.	1	2	3	4
Group members adhered to the instructions	1	2	3	4
Each one had a chance to speak.	1	2	3	4
The group's work was neatly done.				
The answers were calculated correctly.	1	2	3	4

Table 2.56

DO YOU REMEMBER THIS?

When we add and subtract decimal fractions, we could write the numbers below one another and add or subtract normally. The commas, however, have to be **exactly** in lineto ensure that the answer is correct.

E.g. x = 19,046 + 3,49 + 127,6
1 9 , 0 4 6
3 , 4 9
+ 1 2 7 , 6
1 4 0 , 1 3 6

2.55.8 Assessment

Learning Outcome 1:The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.8: We know this when the learner estimates and calculates by selecting and using operations appropriate to solving problems that involve:

1.8.8 addition and subtraction of positive decimals with at least 2 decimal places.

2.56 To calculate by selecting operations appropriate to solving problems[56]

2.56.1 MATHEMATICS

2.56.2 Common and Decimal Fractions

2.56.3 Common Fractions

2.56.4 EDUCATOR SECTION

2.56.5 Memorandum

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[56] This content is available online at <http://cnx.org/content/m31041/1.1/>.

- It is important that educators complete the modules in the above sequence, as the learners will require the knowledge and skills acquired through a previous module to be able to do the work in any subsequent module.

COMMON AND DECIMAL FRACTIONS (LO 1; 2 AND 5)
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- LEARNING UNIT 2 FOCUSES ON DECIMAL FRACTIONS
- This module extends the work that was done in grade 5. Learners should be able to do rounding of decimal fractions to the nearest tenth, hundredth and thousandth. Emphasise the use of the correct method (vertical) for addition and subtraction. Also spend sufficient time on the multiplication and division of decimal fractions.
- As learners usually have difficulty with the latter, you could allow 3 to 4 weeks for this section of the work.

** Activity 19 is a task for the portfolio. The assignment is fairly simple, but learners should complete it neatly and accurately. They must be informed in advance of how the educator will be assessing the work.
1.1 374,019
1.2 613,44
1.3 78,721
14 388,76
BRAIN TEASER!
2.4 200 ; 290 ; 3 ; 10,02 ; 2,1 ; 2,5 ; 3,02
3. Numbers whithin the square are equal to double those in the cicle

2.56.6 LEANER SECTION

2.56.7 Content

2.56.7.1 ACTIVITY: To calculate by selecting operations appropriate to solving problems [LO 1.8.8]

1. Now that you know how to add and subtract decimal fractions, you can tackle the following activity. Work on your own. Calculate the following without using your pocket calculator:
1.1 208,96 + 32,459 + 132,6
1.2 458,843 + 56,397 + 98,2
1.3 143,96 – 65,239
1.4 541,23 – 152,47
2. **BRAIN-TEASER!**
Select any one of the numbers in the circle.

- Add 7,5 to this number.
- Double your answer.

- Subtract 15 from the answer.

Write your answer in the square.

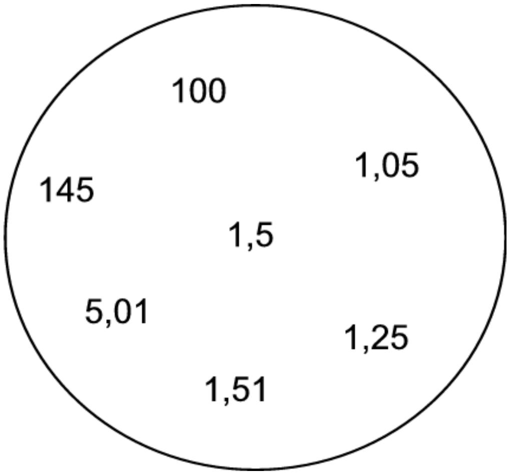


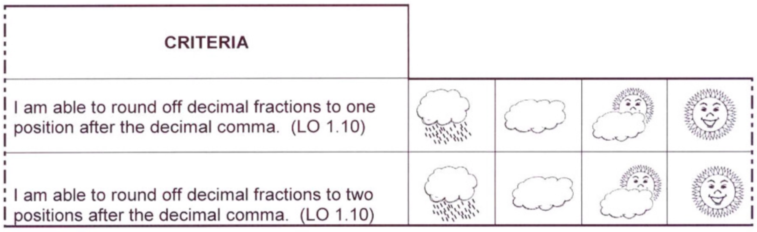
Figure 2.53

- Do exactly the same with each of the other numbers in the circle.

3. What do you notice when you examine the answers?

2.56.7.1.1 TIME FOR SELF-ASSESSMENT

Colour the appropriate block:



CRITERIA				
I am able to round off decimal fractions to one position after the decimal comma. (LO 1.10)	🌧	☁	⛅	☀
I am able to round off decimal fractions to two positions after the decimal comma. (LO 1.10)	🌧	☁	⛅	☀

Figure 2.54

2.56.8

2.56.9 Assessment

Learning Outcome 1:The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.8: We know this when the learner estimates and calculates by selecting and using operations appropriate to solving problems that involve:

1.8.8 addition and subtraction of positive decimals with at least 2 decimal places.

2.57 To perform mental calculations[57]

2.57.1 MATHEMATICS

2.57.2 Common and Decimal Fractions

2.57.3 Common Fractions

2.57.4 EDUCATOR SECTION

2.57.5 Memorandum

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[57] This content is available online at <http://cnx.org/content/m31042/1.1/>.

- As learners usually have difficulty with the latter, you could allow 3 to 4 weeks for this section of the work.

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1.1 12
1.2 8
1.3 4 000
1.4 1 186
1.5 254,5
1.6 1 350
1.7 9 900
1.8 132
1.9 0,87
1.10 0,77
1.11 0,808
1.12 2,62
1.13 2,25
1.14 0,514
1.15 9,45

2.57.6 LEANER SECTION

2.57.7 Content

2.57.7.1 ACTIVITY: To perform mental calculations [LO 1.9.1]

1. Before we continue, we are going to establish how well you manage addition and subtraction of decimal fractions. Complete the following mental calculation test as quickly and accurately as possible:

1.1 .... x 9 = 108	1.9 0,6 + 0,27 =
1.2 (6 × ....) + 9 = 57	1.10 0,45 + 0,32 =
1.3 4 x 10^3 = ...	1.11 0,098 + 0,71 =
1.4 Halve 593:	1.12 2,7 – 0,08 =
1.5 Double 509:	1.13 3,5 – 1,25 =
1.6 1 276 + 74 =	1.14 1 – 0,486 =
1.7 $10^4 - 10^2$ =	1.15 10 – 0,55 =
1.8 ÷ 11 = 12	

Table 2.57

2.57.8 Assessment

Learning Outcome 1:The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.9: We know this when the learner performs mental calculations involving:

1.9.1 addition and subtraction.

2.58 To describe observed rules in your own words[58]

2.58.1 MATHEMATICS

2.58.2 Common and Decimal Fractions

2.58.3 Common Fractions

2.58.4 EDUCATOR SECTION

2.58.5 Memorandum

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- As learners usually have difficulty with the latter, you could allow 3 to 4 weeks for this section of the work.

** Activity 19 is a task for the portfolio. The assignment is fairly simple, but learners should complete it neatly and accurately. They must be informed in advance of how the educator will be assessing the work.

1. 10,2 ; 9 ; 3 ; 4,5 ; 20,41 ; 34,8 ; 3,68
2. 2.1 shifted one position to the left

---

[58] This content is available online at <http://cnx.org/content/m31043/1.1/>.

2.2 shifted one position to the right

3.

3.1 30

90

45

348

102

36,8

204,1

3.2 shifted two positions to the right

3.3 shifted two positions to the left

4.1

NUMBER	0,3	0,9	0,45	3,48	0,368	2,041
x 1 000	300	900	450	3 480	368	2 041

Table 2.58

- shifted three positions to the right

2.58.6 LEANER SECTION

2.58.7 Content

2.58.7.1 ACTIVITY: To describe observed rules in your own words [LO 2.2]

2.58.7.2 To determine output values for given input values [LO 2.3.1]

1. Let's see what happens when we multiply decimal fractions by 10 and multiples of 10. Work with a partner. Find the answers to the following with the help of a pocket calculator:

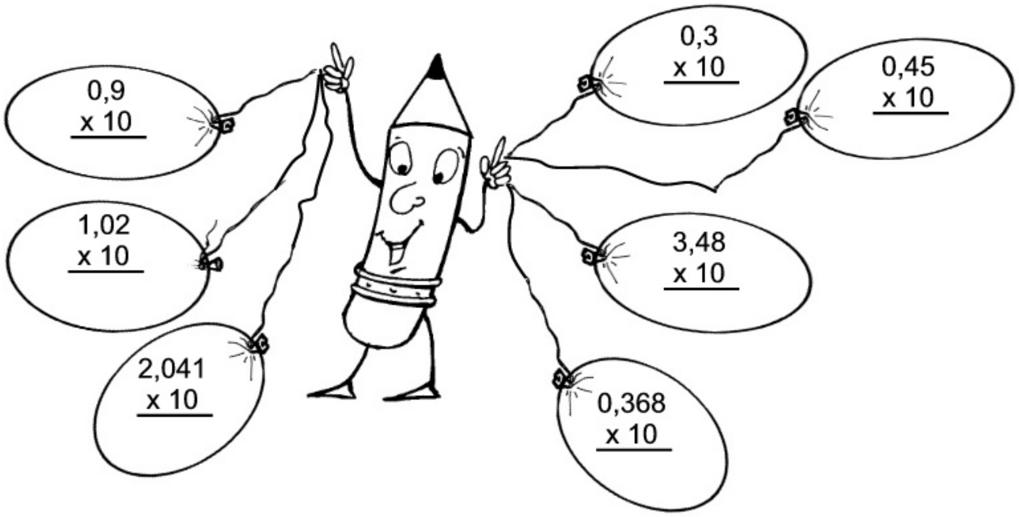


Figure 2.55

2. Answer the following questions::
2.1 What has happened in the case of the **tenths** digit?
2.2 What has happened in the case of the decimal symbol (comma)?
3.
3.1 Complete the flow chart with the help of a pocket calculator:

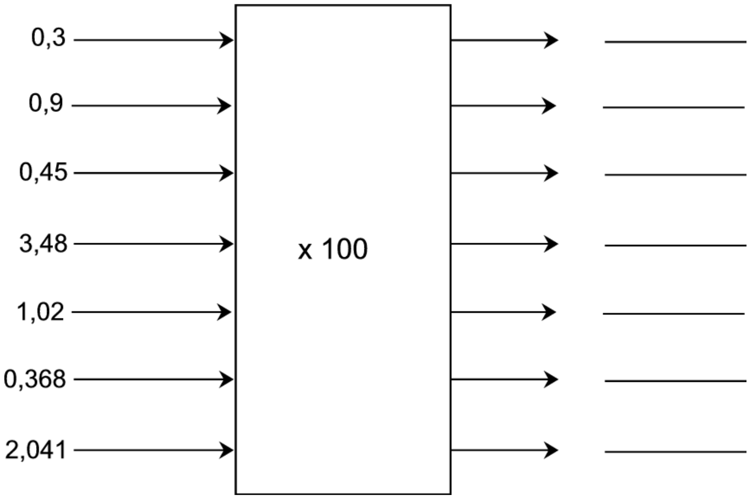


Figure 2.56

- What has happened here in the case of the decimal comma?

- What has happened in the case of the **hundredths** digit?

4.

- Use your pocket calculator and work with a partner to complete the table.

NUMBER	0,3	0,9	0,45	3,48	0,368	2,041
x 1 000						

Table 2.59

- What has happened in the case of the decimal comma?

2.58.7.2.1 REMEMBER!

When we multiply a decimal fraction by 10, the decimal comma is shifted one position to the right.

When we multiply a decimal fraction by 100, the decimal comma is shifted two positions to the right.

When we multiply a decimal fraction by 1 000, the decimal comma moves three positions to the right.

2.58.8 Assessment

Learning Outcome 2:The learner will be able to recognise, describe and represent patterns and relationships, as well as to solve problems using algebraic language and skills.

Assessment Standard 2.2: We know this when the learner describes observed relationships or rules in own words;

Assessment Standard 2.3: We know this when the learner determines output values for given input values, or input values for given output values, using:

2.3.1 verbal descriptions;

2.59 To describe observed rules in your own words[59]

2.59.1 MATHEMATICS

2.59.2 Common and Decimal Fractions

2.59.3 Common Fractions

2.59.4 EDUCATOR SECTION

2.59.5 Memorandum

INTRODUCTION

The learning programme for grade six consists of five modules:

1. Number concept, Addition and Subtraction
2. Multiplication and Division
3. Fractions and Decimal fractions
4. Measurement and Time
5. Geometry; Data handling and Probability

---

[59] This content is available online at <http://cnx.org/content/m31045/1.1/>.

- It is important that educators complete the modules in the above sequence, as the learners will require the knowledge and skills acquired through a previous module to be able to do the work in any subsequent module.

COMMON AND DECIMAL FRACTIONS (LO 1; 2 AND 5)
LEARNING UNIT 1 FOCUSES ON COMMON FRACTIONS

- This module continues the work dealt with in grade 5. Addition and subtraction of fractions are extended and calculation of a fraction of a particular amount is revised.
- Check whether the learners know the correct terminology and are able to use the correct strategies for doing the above correctly.
- Critical outcome 5 (Communicating effectively by using visual, symbolic and /or language skills in a variety of ways) is addressed.
- It should be possible to work through the module in 3 weeks.
- ** Activity 17 is designed as a portfolio task. It is a very simple task, but learners should do it neatly and accurately. They must be informed in advance of how the educator will be assessing the work.

- LEARNING UNIT 2 FOCUSES ON DECIMAL FRACTIONS
- This module extends the work that was done in grade 5. Learners should be able to do rounding of decimal fractions to the nearest tenth, hundredth and thousandth. Emphasise the use of the correct method (vertical) for addition and subtraction. Also spend sufficient time on the multiplication and division of decimal fractions.
- As learners usually have difficulty with the latter, you could allow 3 to 4 weeks for this section of the work.

** Activity 19 is a task for the portfolio. The assignment is fairly simple, but learners should complete it neatly and accurately. They must be informed in advance of how the educator will be assessing the work.

DECIMAL FRACTION	÷ 10	÷ 100	÷ 1 000
0,3	0,03	0,003	0,0003
0,9	0,09	0,009	0,0009
0,45	0,045	0,0045	0,00045
3,48	0,348	0,00348	0,000348
1,02	0,102	0,0102	0,00102
0,368	0,0368	0,00368	0,000368
2,041	0,2041	0,02041	0,002041

Table 2.60

2.1 one position to the left
2.2 two position to the left
2.3 three position to the left

2.59.6 LEANER SECTION

2.59.7 Content

2.59.7.1 ACTIVITY: To describe observed rules in your own words [LO 2.2]

2.59.7.2 To determine output values for given input values [LO 2.3.3]

1. **A CHALLENGE!**

Form groups of three for this exercise. Use exactly the same numbers as in 3.1 and first divide them by 10, then by 100 and finally by 1 000. (You may make use of a pocket calculator).

Complete the table:

DECIMAL FRACTION	÷ 10	÷ 100	÷ 1 000
0,3			
0,9			
0,45			
3,48			
1,02			
0,368			
2,041			

Table 2.61

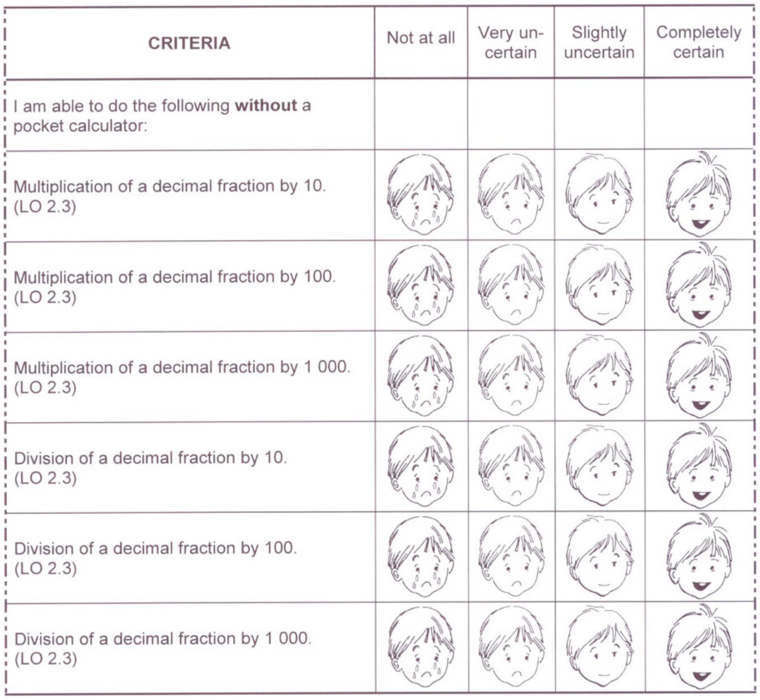
2. See whether you are able to complete the following sentences:

2.1 When we divide a decimal fraction by 10 the decimal comma is shifted

- When we divide a decimal fraction by 100 the decimal comma is shifted
- When we divide a decimal fraction by 1 000 the decimal comma is shifted

TIME FOR SELF-ASSESSMENT

It is important to be sure that you understand the work done so far. Show to what extent you have mastered it by reading the criteria and colouring the appropriate face.



CRITERIA	Not at all	Very un-certain	Slightly uncertain	Completely certain
I am able to do the following **without** a pocket calculator:				
Multiplication of a decimal fraction by 10. (LO 2.3)				
Multiplication of a decimal fraction by 100. (LO 2.3)				
Multiplication of a decimal fraction by 1 000. (LO 2.3)				
Division of a decimal fraction by 10. (LO 2.3)				
Division of a decimal fraction by 100. (LO 2.3)				
Division of a decimal fraction by 1 000. (LO 2.3)				

Figure 2.57

2.59.8 Assessment

Learning Outcome 2:The learner will be able to recognise, describe and represent patterns and relationships, as well as to solve problems using algebraic language and skills.

Assessment Standard 2.2: We know this when the learner describes observed relationships or rules in own words;

Assessment Standard 2.3: We know this when the learner determines output values for given input values, or input values for given output values, using:

2.3.3 tables.

2.60 To use a range of techniques to perform calculations[60]

2.60.1 MATHEMATICS

2.60.2 Common and Decimal Fractions

2.60.3 Common Fractions

2.60.4 EDUCATOR SECTION

2.60.5 Memorandum

INTRODUCTION

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2. Multiplication and Division
3. Fractions and Decimal fractions
4. Measurement and Time
5. Geometry; Data handling and Probability

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COMMON AND DECIMAL FRACTIONS (LO 1; 2 AND 5)

LEARNING UNIT 1 FOCUSES ON COMMON FRACTIONS

- This module continues the work dealt with in grade 5. Addition and subtraction of fractions are extended and calculation of a fraction of a particular amount is revised.
- Check whether the learners know the correct terminology and are able to use the correct strategies for doing the above correctly.
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- It should be possible to work through the module in 3 weeks.
- ** Activity 17 is designed as a portfolio task. It is a very simple task, but learners should do it neatly and accurately. They must be informed in advance of how the educator will be assessing the work.

- LEARNING UNIT 2 FOCUSES ON DECIMAL FRACTIONS
- This module extends the work that was done in grade 5. Learners should be able to do rounding of decimal fractions to the nearest tenth, hundredth and thousandth. Emphasise the use of the correct method (vertical) for addition and subtraction. Also spend sufficient time on the multiplication and division of decimal fractions.
- As learners usually have difficulty with the latter, you could allow 3 to 4 weeks for this section of the work.

** Activity 19 is a task for the portfolio. The assignment is fairly simple, but learners should complete it neatly and accurately. They must be informed in advance of how the educator will be assessing the work.

1.1 34,38
1.2 23,4
1.3 4 562
1.4 10,168
1.5 35,68

---

[60] This content is available online at <http://cnx.org/content/m31210/1.1/>.

1.6 3 4871,1
1.7 52,627
1.8 36,432
1.9 4,3256
1.10 349,81
1.11 451,262
1.12 0,2395

2.60.6 LEANER SECTION

2.60.7 Content

2.60.7.1 ACTIVITY: To use a range of techniques to perform calculations [LO 1.10.5]

1. **WHO OR WHAT IS HIDDEN HERE?**

Find the answers to the clues with the help of your pocket calculator. Then olour in the spaces that contain the correct answers.

CLUES:

1.1 17,98 + 16,4 =	1.7. 38,62 + 14,007 =
1.2. 32 – 8,6 =	1.8 17,9 + 18,532 =
1.3. 4,562 x 1 000 = ……………..	1.9 432,56 ÷ 100 =
1.4. 25 – 14,832 =	1.10 34,981 ÷ 10 =
1.5. 3,568 x 10 =	1.11 518,5 – 67,238 =
1.6. 34,871 x 100 =	1.12 239,5 ÷ 1 000 =

Table 2.62

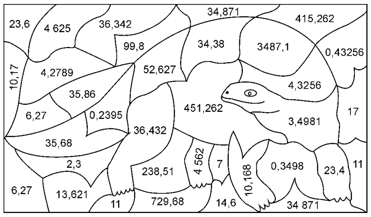

Figure 2.58

2.60.8 Assessment

Learning Outcome 1:The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.10: We know this when the learner uses a range of techniques to perform written and mental calculations with whole numbers including:
1.10.5 using a calculator.

2.61 To resolve problems in context[61]

2.61.1 MATHEMATICS

2.61.2 Common and Decimal Fractions

2.61.3 Common Fractions

2.61.4 EDUCATOR SECTION

2.61.5 Memorandum

INTRODUCTION

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COMMON AND DECIMAL FRACTIONS (LO 1; 2 AND 5)

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- LEARNING UNIT 2 FOCUSES ON DECIMAL FRACTIONS
- This module extends the work that was done in grade 5. Learners should be able to do rounding of decimal fractions to the nearest tenth, hundredth and thousandth. Emphasise the use of the correct method (vertical) for addition and subtraction. Also spend sufficient time on the multiplication and division of decimal fractions.
- As learners usually have difficulty with the latter, you could allow 3 to 4 weeks for this section of the work.

** Activity 19 is a task for the portfolio. The assignment is fairly simple, but learners should complete it neatly and accurately. They must be informed in advance of how the educator will be assessing the work.

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[61] This content is available online at <http://cnx.org/content/m31213/1.1/>.

2.61.6 LEANER SECTION

2.61.7 Content

2.61.7.1 ACTIVITY: To resolve problems in context [LO 1.6.2]

2.61.7.2 To collect data and answer questions [LO 5.2]

2.61.7.3 To record data [LO 5.4]

2.61.7.4 To draw graphs [LO 5.6]

** This activity is for inclusion in your portfolio. Before you start make sure that you understand what needs to be done and how you will be assessed.

1. Look at the odometer of your parent's car and write down the current reading.
2. Write down readings from four other motor vehicles to which you have access (family, friends, taxis, school bus, etc.)
3. Indicate this information on a graph of your own choice.
4. Determine the total distance travelled by all five of the vehicles.
5. Calculate the difference between the vehicle that has travelled the longest distance and the one that has travelled the shortest distance.
6. If your father's car has a tank that can take 55 litres of petrol and is completely empty, what will it cost to fill the tank if the petrol for it costs R3,89 per litre?

ASSESSMENT: ODOMETERS:

1 = not at all 2 = just a little 3 = good 4 = outstanding

CRITERIA	CODE			
	1	2	3	4
Completeness	Hardly any instruction has been carried out.	Half of the instructions have been carried out.	One or two instructions have not been carried out.	All instructions have been carried out.
Graph	It is almost impossible to interpret.	The data are not organised and it is difficult to interpret.	The graph can be interpreted although it is not 100% correct.	The graph is well organised and the presentation of the data is meaningful. It is easy to interpret.

continued on next page

Correctness of calculations	All the calculations are incorrect.	Many mistakesoccur.	A few mistakes occur.	All answers are correctly calculated.

Table 2.63

2.61.8 Assessment

Learning Outcome 1:The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.6: We know this when the learner solves problems in context, including contexts that may be used to build awareness of other Learning Areas, as well as human rights, social, economic and environmental issues such as:

1.6.2 measurements in Natural Sciences and Technology contexts;

Learning Outcome 5:The learner will be able to collect, summarise, display and critically analyse data in order to draw conclusions and make predictions, and to interpret and determine chance variation.

Assessment Standard 5.2: We know this when the learner uses simple data collection sheets (requiring tallies) and simple questionnaires (with yes/no type responses) in order to collect data (alone and/or as a member of a group or team) to answer questions posed by the teacher, class and self;

Assessment Standard 5.4: We know this when the learner organises and records data, using tallies and tables;

Assessment Standard 5.6: We know this when the learner draws a variety of graphs by hand/technology to display and interpret data (grouped and ungrouped).

2.62 Test[62]

2.62.1 MATHEMATICS

2.62.2 Common and Decimal Fractions

2.62.3 Common Fractions

2.62.4 EDUCATOR SECTION

2.62.5 Memorandum

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COMMON AND DECIMAL FRACTIONS (LO 1; 2 AND 5)

LEARNING UNIT 1 FOCUSES ON COMMON FRACTIONS

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[62] This content is available online at <http://cnx.org/content/m31214/1.1/>.

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- As learners usually have difficulty with the latter, you could allow 3 to 4 weeks for this section of the work.

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2.62.6 LEANER SECTION

2.62.7 Content

2.62.7.1 TEST

1. Write the following as decimal fractions:
1.1 $\mathbf{\frac{19}{20}}$.
1.2 $\frac{5}{8}$. (2)
2. Write the following as common fractions:
2.1 0,782 2.2 0,57
(2)
3. Round off to one position after the decimal comma:
3.1 4,673 3.2 21,392
(2)
4. Round off to the nearest hundredth:
4.1 4,673 4.2 21,392
(2)
5. Round off to three positions after the decimal comma:
5.1 4,9766 5.2 2,6755
(2)
6. Fill in: < ; > of = :

- 0,432 $\frac{43}{100}$
- $3\frac{15}{100}$ 3,015
- $\frac{202}{1000}$ 0,202

(3)
7. Fill in the missing answers:

- 97,5 ÷ 100 =
- 42,39 x 1 000 = (4)

8. Calculate:

- 345,7 + 84,92 + 3,879

(2)

- 238,21 – 78,945

(2)

9. Cornelius caught a 3,782 kg fish. His friend, Petrus, caught a fish weighing 2,879 kg, while Carolus landed one with a mass of 6,45 kg. What is the combined mass of the fish that they caught?

(3)

10. Angelique's mass is 43,28 kg. How much less is her mass than Arabella's, whose mass is 68,59 kg?

(3)

(25)

Chapter 3

Term 3

3.1 To measure and calculate a perimeter[1]

3.1.1 MATHEMATICS

3.1.2 Measurement and Time

3.1.3 Length

3.1.4 EDUCATOR SECTION

3.1.5 Memorandum

3.1.6

1. 88
    2. 8,8
    3. 0,88
    4. 11
    5. 110
    6. 1,1
    7. 0,11
    8. 0,111
    9. 1 000 m
    10. 10 mm
    11. 1 000 m
    12. 1 000 000 mm
    13. 208
    14. 8
    15. 39

---

[1] This content is available online at <http://cnx.org/content/m21019/1.1/>.

3.1.7

3.1.8 Leaner Section

3.1.9 Content

3.1.10

In this module we are going to measure with the aid of various instruments.

We are going to measure:

- length,
- mass,
- circumference,
- area,
- volume,
- content,
- temperature and
- time.

3.1.11 ACTIVITY: To measure and calculate a perimeter [LO 4.4.3, LO 4.8.1]

1. An ant must walk from A to B, then to C, D, E and again to A (right around – perimeter).

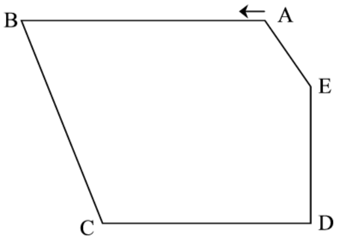

Figure 3.1

1.1 What instrument will you use to calculate how far the ant walks?

1.2 Now calculate the distance the ant has walked.

____

____

1.3 In what unit did you measure? ______________________________________

1.4 What unit did your friend use? ______________________________________

2. Take a look at the following figures. Are you able to tell the educator what the "ordinary" name for each one (excepting the square) is?

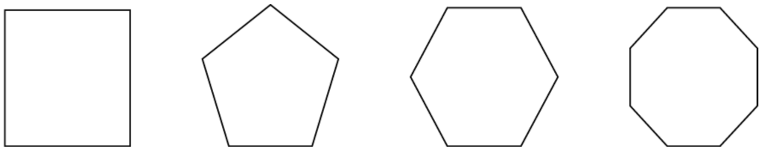

Figure 3.2

square

2.1 These shapes are regular. Why?

____

____

____

____

2.2 Calculate the perimeter of each shape (remember the units). Write the name of each shape, followed by the answer.

(a) ____

(b) ____

(c) ____

(d) ____

2.3 If the perimeter of a square can be calculated by means of the formula 4 x side, which formula would be used for each of these shapes? Write the name of the shape, followed by the answer.

(a) ____

(b) ____

(c) ____

(d) ____

2.4 What do we call the following shape?

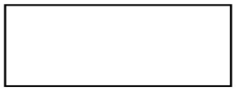

Figure 3.3

____

2.5 Can you perhaps deduce a formula for calculating the perimeter of a rectangle?

____

REMEMBER THIS!

A square also happens to be a rectangle. It just happens to be one with four equal sides. All squares are rectangles, but all rectangles are not square.

3. Here are a few irregular shapes.

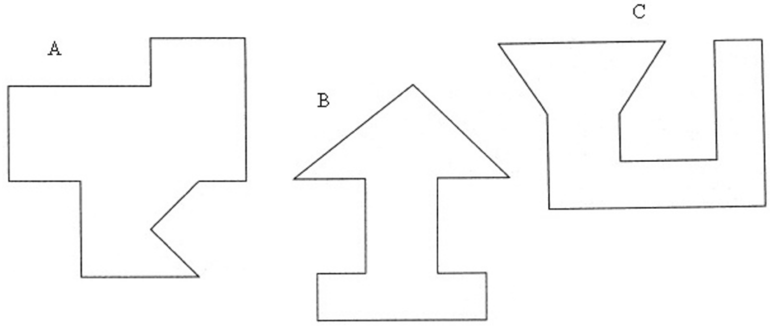

Figure 3.4

3.1 Why do we say that these shapes are irregular?
____
3.2 Now calculate the perimeter of each of the irregular shapes.
A: ____
B: ____
C: ____

3.1.12 Assessment

Learning Outcome 4: The learner will be able to use appropriate measuring units, instruments and formulae in a variety of contexts.

Assessment Standard 4.4: We know this when the learner estimates, measures, records, compares and orders two-dimensional shapes and three-dimensional objects using S.I. units with appropriate precision for:

4.4.3: length using millimetres (mm), centimetres (cm), metres (m) and kilometres (km);

Assessment Standard 4.8: We know this when the learner investigates and approximates (alone and/or as a member of a group or team):

4.8.1: perimeter using rulers or measuring tapes.

3.2 To perform mental calculations[2]

3.2.1 MATHEMATICS

3.2.2 Measurement and Time

3.2.3 Length

3.2.4 EDUCATOR SECTION

3.2.5 Memorandum

1. Length of your desk = cm
   Your own height = cm / m
   Width of the class = m
   Thickness of your writing pad = mm

---

[2] This content is available online at <http://cnx.org/content/m21020/1.1/>.

Length of your pencil = cm / mm
2. km

- 1 000
- 1 000
- 100
- 10

3.2.6

3.2.7 Leaner Section

3.2.8 Content

3.2.9 ACTIVITY: To perform mental calculations [LO 1.9]

Let us see how well you can remember the work that was done in the previous module. Complete this mental calculation test as quickly and as accurately as possible:

1. 11 x 8 = _________________________________
2. 11 x 0,8 = ______________________________
3. 1,1 x 0,8 = ______________________________
4. 1,1 x 10 = ______________________________
5. 1,1 x 100 = _____________________________
6. 11 ÷ 10 = _______________________________
7. 11 ÷ 100 = ______________________________
8. ______________________________ x 1 000 = 111
9. 1 m = ______________________________ mm
10. 1 cm = ______________________________ mm
11. 1 km = ______________________________ m
12. 1 km = ______________________________ mm
13. 2 x 104 = ______________________________
14. 0,4 x 20 = ______________________________
15. Double 19,5 : ____________________________

3.2.10 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.9: We know this when the learner performs mental calculations involving.

3.3 To estimate, measure and record 2-dimensional shapes and 3-dimensional objects[3]

3.3.1 MATHEMATICS

3.3.2 Measurement and Time

3.3.3 Length

3.3.4 EDUCATOR SECTION

3.3.5 Memorandum

1. Length of your desk = cm
   Your own height = cm / m
   Width of the class = m
   Thickness of your writing pad = mm
   Length of your pencil = cm / mm
   2. km

- 1 000
- 1 000
- 100
- 10

3.3.6 Leaner Section

3.3.7 Content

3.3.8 ACTIVITY: To estimate, measure and record 2-dimensional shapes and 3-dimensional objects [LO 4.4.3]

3.3.9 To use appropriate measuring instruments [LO 4.6.3]

From the work that was completed in Grades 4 and 5, you know that we always measure in units.
   1. Take a good look at the following and then complete the table:

- Indicate which units you will use.
- Estimate the length.
- Then measure the true length.

	Unit	Estimate	Actual length
Length of your desk	_______________	_______________	_______________
Your own height	_______________	_______________	_______________

continued on next page

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[3] This content is available online at <http://cnx.org/content/m21021/1.1/>.

Width of the class	_______________	_______________	_______________
Thickness of your writing pad	_______________	_______________	_______________
Length of your pencil	_______________	_______________	_______________

Table 3.1

2. In what unit would you measure the distance between your home and the school? ____

3. Let us test your memory! See whether you are able to answer the following questions:
3.1 How many metres are there in 1 kilometre?______________________________
3.2 How many millimetres are there in 1 metre? _____________________________
3.3 How many centimetres are there in 1 metre? _____________________________
3.4 How many millimetres are there in 1 centimetre? ________________________
DO YOU REMEMBER THIS?
You should know it, but let us look at it again:

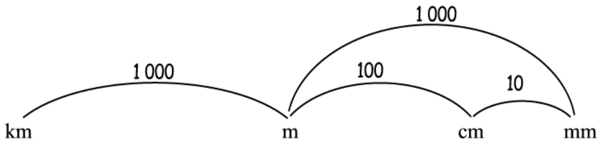

Figure 3.5

km m cm mm

3.3.10 Assessment

Learning Outcome 4: The learner will be able to use appropriate measuring units, instruments and formulae in a variety of contexts.

Assessment Standard 4.5: We know this when the learner estimates, measures, records, compares and orders two-dimensional shapes and three-dimensional objects using S.I. units with appropriate precision for:

4.4.3: length using millimetres (mm), centimetres (cm), metres (m) and kilometres (km);

Assessment Standard 4.6: We know this when the learner re uses appropriate measuring instruments (with understanding of their limitations) to appropriate levels of precision including:

4.6.3: rulers, metre sticks, tape measures and trundle wheels to measure length.

3.4 To solve problems involving converting between units[4]

3.4.1 MATHEMATICS

3.4.2 Measurement and Time

3.4.3 Length

3.4.4 EDUCATOR SECTION

3.4.5 Memorandum

Length in metres	6	2,001	0,040	0,338	24	16,867
Length in millimetres	6 000	2 001	40	338	24 000	16 867

Table 3.2

Length in metres	2	0,6	3, 84	12, 69	20,05	9
Length in centimetres	200	60	384	1 269	2 005	900

Table 3.3

Length in kilometres	0,500	13,7	4,618	2,999	8,006	22,419
Length in metres	500	13 700	4 618	2 999	8 006	22 419

Table 3.4

3.4.6 LEANER SECTION

3.4.7 Content

3.4.7.1 ACTIVITY: To solve problems involving converting between units [LO 4.5]

3.4.7.2 To determine output values for given input values [LO 2.3.3]

1. Complete the following tables:

Length in metres	6	2,001	_ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _	24	_ _ _ _ _ _ _ _
Length in millimetres	_ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _	40	338	_ _ _ _ _ _ _ _	16 867

Table 3.5

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[4] This content is available online at <http://cnx.org/content/m21022/1.1/>.

Length in metres	________	________	3,84	12,69	________	9
Length in centimetres	200	60	________	________	2 005	________

Table 3.6

Length in kilometres	0,500	13,7	________	________	8,006	________
Length in metres	________	________	4 618	2 999	________	22 419

Table 3.7

3.4.8 Assessment

Learning Outcome 2: The learner will be able to recognise, describe and represent patterns and relationships, as well as to solve problems using algebraic language and skills.

Assessment Standard 2.3: We know this when the learner determines output values for given input values, or input values for given input values, using:

2.3.3: tables;

Learning Outcome 4: The learner will be able to use appropriate measuring units, instruments and formulae in a variety of contexts.

Assessment Standard 4.4: We know this when the learner estimates, measures, records, compares and orders two-dimensional shapes and three-dimensional objects using S.I. units with appropriate precision.

3.5 To solve problems in context[5]

3.5.1 MATHEMATICS

3.5.2 Measurement and Time

3.5.3 Length

3.5.4 EDUCATOR SECTION

3.5.5 Memorandum

1.1 K-S 50 km
S-C 60 km
C-S 70 km
S-H 70 km
H-R 20 km
R-M 35 km
1.2 ± 275 km
275 km ÷ 9 km = 30,35 = ± 30,5 ℓ
1.3 30,5 × R 5,80 = R 176,90
1.4 1 350 ÷ 100 = 13,5
13,5 × 140 = 1 890
= 1 890 steps

---

[5] This content is available online at <http://cnx.org/content/m21026/1.1/>.

3.5.6 LEANER SECTION

3.5.7 Content

3.5.7.1 ACTIVITY: To solve problems in context [LO 1.6.1, LO 1.6.2]

3.5.7.2 To write number sentences to describe problem situations [LO 2.4]

1. You may choose a partner to work with for the next activity. Read the problems and solve them. Write neat number sentences, showing the operations clearly. Remember the units!

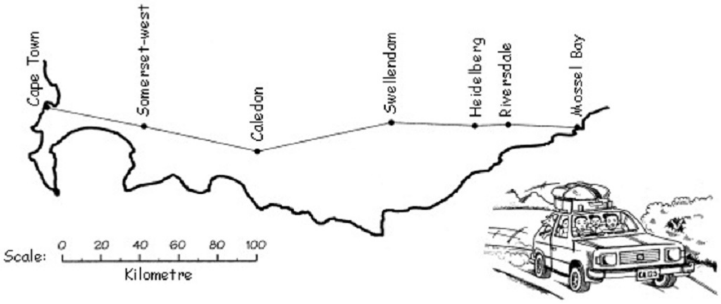

Figure 3.6

1.1 Study the map with scale and your ruler and determine the distances between the various towns/cities.

____

____

____

____

____

____

1.2 What is the total distance (as measured by you) between Cape Town and Mossel Bay?

____

If the fuel consumption of a car is 9 km / ℓ, how many litres of fuel are needed for the trip?

____

____

____

____

1.3 Now use these answers and calculate what the fuel for the journey will cost if fuel currently costs R5,80 per litre.

____

____

____

____

1.4 A girl has to take 140 steps to cover a distance of 100 m. She lives 1,350 km from the school. How many steps will she have to take to cover the distance?

____

____

____

____
____
____
____
____

1.5 Explain to the rest of the class how the two of you calculated the answers.

____
____
____
____
____
____
____
____

1.6 Compare your methods with those of the rest of the class. How do they differ and how are they similar?

____
____
____
____
____
____
____
____

Assess your work on a scale of 1 – 4 by circling the appropriate number:
1 = not at all
2 = not very well
3 = well
4 = excellently

CRITERIA	CODE			
My partner and I worked together.	1	2	3	4
We listened to one another.	1	2	3	4
We answered all the questions.	1	2	3	4
We worked neatly.	1	2	3	4
Our answers were correct.	1	2	3	4

Table 3.8

3.5.8 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.6: We know this when the learner solves problems in context including contexts that may be used to build awareness of other Learning Areas, as well as human rights, social, economic and environmental issues such as:

1.6.1: financial;

1.6.2: measurements in Natural Sciences and Technology contexts;

Learning Outcome 2: The learner will be able to recognise, describe and represent patterns and relationships, as well as to solve problems using algebraic language and skills.

Assessment Standard 2.4: We know this when the learner writes number sentences to describe a problem situation, including problems within contexts that may be used to build awareness of human rights, social, economic, cultural and environmental issues.

3.6 To solve problems in context[6]

3.6.1 MATHEMATICS

3.6.2 Measurement and Time

3.6.3 Length

3.6.4 EDUCATOR SECTION

3.6.5 Memorandum

1. Susan = 3,48
Lala = 3,4
Lauren = 3,2
Anna = 3,12
2. Susan: (2,32 + 3,48 + 3,02 + 2,9) ÷ 4 = 2,93 (2,9 m)
Lala: (3,2 + 3,04 + 2,86 + 3,4) ÷ 4 = 3,125 (3,1 m)
Lauren: (2,88 + 2,96 + 3,06 + 3,2) ÷ 4 = 3,025 (3 m)
Anna: (3,02 + 2,94 + 2,84 + 3,12) ÷ 4 = 2,98 (3 m)
3. (12,95 km + 14,73 km + 8,94 km + 13,8 km + 6,86 km) ÷ 5
= 11,456 km (11,5 km)
4. 11,5 km

3.6.6 LEANER SECTION

3.6.7 Content

3.6.8

3.6.9 ACTIVITY: To solve problems in context [LO 1.6.2]

It is important to be able to calculate averages, because it is something that is commonly used in everyday life. You have heard of average rainfall per month, the average temperature of the place where you live during a particular season, your class average, etc.

1. Take a good look at the following and then write down what the distance of the best jump of each athlete is:

At an athletics meeting four athletes participated in the u.13 long jump for girls.

Each completed four jumps.

---

[6] This content is available online at <http://cnx.org/content/m21028/1.1/>.

Name	**Jump 1** m	**Jump 2** m	**Jump 3** m	**Jump 4** m	**Best Jump** m
Susan	2,32	3,48	3,02	2,9	_____________
Lala	3,2	3,04	2,86	3,4	_____________
Lauren	2,88	2,96	3,06	3,2	_____________
Anna	3,02	2,94	2,84	3,12	_____________

Table 3.9

- By looking at each girl's best jump, we can determine who won.
- However, this does not tell us who fared the best in general (over all the jumps).
- To determine this we have to look at the average of each girl's jumps.
- The following is the formula for calculating the average:

Average distance =

$$\frac{\text{total of all the jumps}}{\text{number of jumps}}$$

Figure 3.7

In Susan's case it will be calculated as follows:

$$\frac{2{,}32\ m + 3{,}48\ m + 3{,}02\ m + 2{,}9\ m}{4}$$

Figure 3.8

= 2,93 m (rounded off to the first decimal: 2,9 m)

2. Now use this formula to determine, according to the averages for the four athletes, who generally fared the best in the long jump for u.13 girls (rounded off to the first decimal).

____

____

____

____

____

____

____

____

3. Calculate the average distance that Johan runs per day if he ran the following distances from Monday to Friday:

Mon. 12,95 km; Tue. 14,73 km; Wed. 8,94 km; Thu. 13,8 km; Fri. 6,86 km.

____

____

____

____

____

____

____

____

4. Round off your answer to the first decimal place.

____

3.6.9.1 TIME FOR SELF-ASSESSMENT

We examined particular aspects of measuring in Learning Unit 1. Before starting to work through Learning Unit 2, we have to find out whether there are any hitches, i.e. whether there is anything that you do not understand properly. Show us how you feel about the completed work by neatly colouring the blocks that represent your feelings about the work:

CRITERIA

I know the meaning of **perimeter**.	Not at all	Fairly well	Well	Really well
I know the formula for determining the perimeter of a square. (LO 4.8)	Not at all	Fairly well	Well	Really well
I am able to determine the perimeters of the following figures:	Not at all	Fairly well	Well	Really well
Square (LO 4.8)	Not at all	Fairly well	Well	Really well
Pentagon (LO 4.8)	Not at all	Fairly well	Well	Really well
Hexagon (LO 4.8)	Not at all	Fairly well	Well	Really well
Octagon (LO 4.8)	Not at all	Fairly well	Well	Really well
I am able to determine the perimeter of an irregular figure. (LO 4.8)	Not at all	Fairly well	Well	Really well

continued on next page

I am able to convert metres to millimetres and vice versa. (LO 4.8)	Not at all	Fairly well	Well	Really well
I am able to convert metres to centimetres and vice versa. (LO 4.8)	Not at all	Fairly well	Well	Really well
I am able to convert kilometres to metres and vice versa. (LO 4.5)	Not at all	Fairly well	Well	Really well
I am able to determine distances according to scale. (LO 1.6)	Not at all	Fairly well	Well	Really well
I am able to calculate **average** distance. (LO 1.6)	Not at all	Fairly well	Well	Really well

Table 3.10

3.6.10 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.6: We know this when the learner solves problems in context including contexts that may be used to build awareness of other Learning Areas, as well as human rights, social, economic and environmental issues such as:

1.6.2: measurements in Natural Sciences and Technology contexts.

3.7 To investigate how to determine area[7]

3.7.1 MATHEMATICS

3.7.2 Measurement and Time

3.7.3 Area

3.7.4 EDUCATOR SECTION

3.7.5 Memorandum

3.7.6

1.1 $5 \times 7 = 35$

1.2 $1 \times b = \text{opp.}$

---

[7] This content is available online at <http://cnx.org/content/m21029/1.1/>.

3.7.7 LEANER SECTION

3.7.8 Content

3.7.9

Have you ever had new tiles or carpets laid in your house? What do you have to know about a room to be able to have something like this done?

3.7.10 ACTIVITY: To investigate how to determine area [LO 4.8.2]

1. This is the floor plan of the Vissers' kitchen. Mrs Visser wants to lay new tiles. The tiles are each 1 m wide and 1 m long.

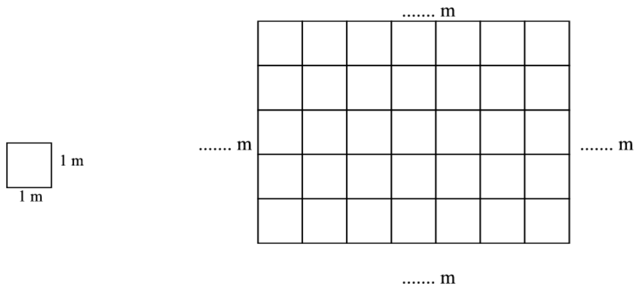

Figure 3.9

1.1 How many tiles do you need to cover the floor?

____

1.2 How did you calculate this? Can you explain this in one or two clear number sentences?

____

____

____

REMEMBER:
You multiply the length of the one side with the length of the other one.
The unit is then expressed to the power of 2 (m2).

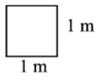

Figure 3.10

You have just calculated the area of Mrs Visser's kitchen floor.
1.3 Can you perhaps write down a formula for calculating the area of such a regular shape?
Area of a rectangle: ____

3.7.11 Assessment

Learning Outcome 4: The learner will be able to use appropriate measuring units, instruments and formulae in a variety of contexts.

Assessment Standard 4.8: We know this when the learner investigates and approximates (alone and/or as a member of a group or team):

4.8.2: area of polygons (using square grids) in order to develop rules for calculating the area of squares and rectangles.

3.8 To calculate area[8]

3.8.1 MATHEMATICS

3.8.2 Measurement and Time

3.8.3 Area

3.8.4 EDUCATOR SECTION

3.8.5 Memorandum

1. A: ± 20 squares = 20×25 mm^2
   B: ± 10 squares = 10×25 mm^2

3.8.6 LEANER SECTION

3.8.7 Content

3.8.8 ACTIVITY: To calculate area [LO 4.8.2]

1. Now determine the area of the following objects by using the "square sheet" method (each square is 5 mm by 5 mm).

---

[8] This content is available online at <http://cnx.org/content/m21032/1.1/>.

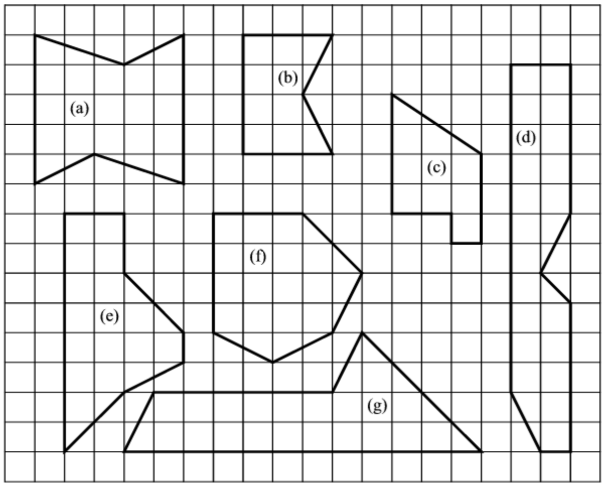

Figure 3.11

a: ____

b: ____

c: ____

d: ____

e: ____

f: ____

g: ____

(Discuss the method you used with a friend).

3.8.8.1

3.8.8.2 Assessment

Learning Outcome 4: The learner will be able to use appropriate measuring units, instruments and formulae in a variety of contexts.

Assessment Standard 4.8: We know this when the learner investigates and approximates (alone and/or as a member of a group or team):

4.8.2: area of polygons (using square grids) in order to develop rules for calculating the area of squares and rectangles.

3.9 To calculate area by investigating and estimating[9]

3.9.1 MATHEMATICS

3.9.2 Measurement and Time

3.9.3 Area

3.9.4 EDUCATOR SECTION

3.9.5 Memorandum

3.9.6

1.1 13 cm × 13 cm = 169 cm^2
1.2 2,2 m × 1,4 m = 3,08 m^2
1.3 181 m × 93 m = 16 833 m^2
1.4 4,2 m × 2,8 m = 11,76 m^2
1.5 243 mm × 178 mm = 43 254 mm^2

3.9.7 LEANER SECTION

3.9.8 Content

3.9.9

3.9.10 ACTIVITY: To calculate area by investigating and estimating [LO 4.8.2]

1. Let us see whether you are able to calculate the area of the following (remember to begin your operations with a number sentence and also to take care to include the unit when you write down your final answer):

1.1 the area of a square with a side length of 13 cm

____

____

____

1.2 the top of a desk of 2,2 m by 1,4 m

____

____

____

1.3 an elongated rugby field that is 181 m long and 93 m wide

____

____

____

1.4 how much carpeting you need to cover the floor of a room that is 4,2 m by 2,8 m

____

____

____

1.5 the cover of a Mathematics book with a length of 243 mm and a width of 178 mm.

____

____

____

---

[9] This content is available online at <http://cnx.org/content/m21034/1.1/>.

3.9.11 Assessment

Learning Outcome 4: The learner will be able to use appropriate measuring units, instruments and formulae in a variety of contexts.

Assessment Standard 4.8: We know this when the learner investigates and approximates (alone and/or as a member of a group or team):

4.8.2: area of polygons (using square grids) in order to develop rules for calculating the area of squares and rectangles.

3.10 To solve problems in context[10]

3.10.1 MATHEMATICS

3.10.2 Measurement and Time

3.10.3 Area

3.10.4 EDUCATOR SECTION

3.10.5 Memorandum

1.1 22 m + 11 m + 33 m + 40 m + 28 m + 68 m = 202 m

1.2 202 poles

2. 112 m × 75 m = 8 400 m^2

Cost: 8 400 × R1,20 = R10 080

3. 45 m × 45 m = 2 025 m^2

R56 679,75 ÷ 2 025 = R27,99/m^2

4. 225 cm × 75 cm = 16 875 cm^2

2,25 m × 0,75 m = 1,6875 m^2

5. 50,32 m^2 ÷ 7,4 m = 6,8 m

3.10.6 LEANER SECTION

3.10.7 Content

3.10.7.1 Activity: To solve problems in context [LO 1.6.2]

3.10.7.2 To calculate area by investigating and estimating [LO 4.8.2]

You have to divide into groups of three for this activity. You may use pocket calculators for solving the problems. Work neatly and show clearly how you go about to find the answers. Enjoy puzzling it out!

1. A farmer has to fence a paddock containing calves.

---

[10] This content is available online at <http://cnx.org/content/m21041/1.1/>.

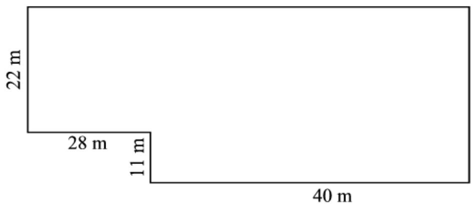

Figure 3.12

1.1 Calculate how much wire is needed to fence the paddock.

____

____

____

1.2 If the poles for the fence are planted 1 m apart, how many poles are required?

____

____

____

2. Grass seed has to be sown on the new hockey field. The field is 112 m by 75 m. If the seed costs R1,20 per m2, what will the cost for the whole project be?

____

____

____

____

____

____

3. If a square playing field with a length of 45 m is tarred, the total cost is R56 679,75. What is the cost of the tar per 1 m2?

____

____

____

____

____

____

4. A portion of a bathroom wall of 2,25 m by 0,75 m must be covered by new tiles. The tiles are square, with a length of 15 cm. How many tiles are required?

____

____

____

____

____

____

5. A classroom has an area of 50,32 m2. If the length is 7,4 m, what is the width?

____

____

____

____

____

____

ASSESSMENT: PROBLEM SOLVING

CRITERIA	CODE			
Neatness and organisation	The work is untidy and is disorganised.	The work is organised but is difficult to read.	The work is neat and organised and easy to read.	Neat and clearly set out work; clearly legible.
Logical reasoning	There is very little evidence of logical reasoning	There is some evidence of logical reasoning	Effective mathematical reasoning was used.	Sophisticated logic and reasoning was used.
Correctness of calculations	All the answers are calculated incorrectly	Many mistakes occur.	Few mistakes occur.	All answers are correctly calculated.

Table 3.11

3.10.8 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.6: We know this when the learner solves problems in context including contexts that may be used to build awareness of other Learning Areas, as well as human rights, social, economic and environmental issues such as:

1.6.2: measurements in Natural Sciences and Technology contexts;

Learning Outcome 4: The learner will be able to use appropriate measuring units, instruments and formulae in a variety of contexts.

Assessment Standard 4.8: We know this when the learner investigates and approximates (alone and/or as a member of a group or team):

4.8.2: area of polygons (using square grids) in order to develop rules for calculating the area of squares and rectangles.

3.11 To estimate, measure and record the mass of 2-dimensional shapes and to use appropriate measuring instruments[11]

3.11.1 MATHEMATICS

3.11.2 Measurement and Time

3.11.3 Length

3.11.4 EDUCATOR SECTION

3.11.5 Memorandum

3.11.6 LEANER SECTION

3.11.7 Content

3.11.7.1 ACTIVITY: To estimate, measure and record the mass of 2-dimensional shapes and to use appropriate measuring instruments [LO 4.6.1]

3.11.7.2 To use appropriate measuring instruments [LO 4.6.1]

1. Have you ever paused to think about how many things we pick up and carry around with us every day? You can say whether something is heavy or light, but have you ever wondered what the mass of a particular article is, that you are carrying? Let us look at a couple of examples. Complete the following table. First estimate and then determine the exact mass. Use a kitchen scale!

Item	Mass in gram	
	Estimated	Measured
1.1 tin of cool drink	_______________________	_______________________
1.2 hairbrush	_______________________	_______________________
1.3 pencil box	_______________________	_______________________
1.4 Mathematics book	_______________________	_______________________

Table 3.12

3.11.8 Assessment

Learning Outcome 4: The learner will be able to use appropriate measuring units, instruments and formulae in a variety of contexts.

Assessment Standard 4.6: We know this when the learner uses appropriate measuring instruments (with understanding of their limitations) to appropriate levels of precision including:

4.6.1: bathroom scales, kitchen scales and balances to measure mass.

---

[11] This content is available online at <http://cnx.org/content/m21111/1.1/>.

3.12 To calculate by selecting appropriate operations for solving particular problems[12]

3.12.1 MATHEMATICS

3.12.2 Measurement and Time

3.12.3 Area

3.12.4 EDUCATOR SECTION

3.12.5 Memorandum

1.1 2 915,95 kg
1.2 1,998 kg
1.3 0,750 kg
1.4 26,082 kg
2.1 3,098 kg
2.2 4,104 kg
2.3 1,219 kg
2.4 18,797 kg
3.1 48,688 kg
3.2 15 272 kg
3.3 8 722 kg
3.4 238,117 g
3.5 0,320 kg
3.6 127,296 g

3.12.6 LEANER SECTION

3.12.7 Content

3.12.7.1 ACTIVITY: To calculate by selecting appropriate operations for solving particular problems [LO 4.5]

Let's first see how well you are able to add and subtract without the help of a pocket calculator.

1. Reduce the following masses by 50 g:
1.1 2 916 kg = _______________________________________ kg
1.2 2,048 kg = _______________________________________ kg
1.3 0,800 kg = _______________________________________ kg
1.4 26,132 kg = ______________________________________ kg
2. Increase the following masses by 300 g:
2.1 2,798 kg = _______________________________________ kg
2.2 3,804 kg = _______________________________________ kg
2.3 0,919 kg = _______________________________________ kg
2.4 18,497 kg = ______________________________________ kg
3. Complete the calculations without the use of a calculator (first make units the same):
3.1 38,942 kg + 9,746 kg =

____
____
____
____

---

[12] This content is available online at <http://cnx.org/content/m21079/1.1/>.

_ _

3.2 6 913 kg + 8,359 t =

_ _

_ _

_ _

_ _

_ _

3.3 9 t - 278 kg =

_ _

_ _

_ _

_ _

_ _

3.4 18,517 g + 219,6 g =

_ _

_ _

_ _

_ _

_ _

3.5 8 kg ÷ 25 =

_ _

_ _

_ _

_ _

_ _

3.6 15,912 g × 8 =

_ _

_ _

_ _

_ _

_ _

3.12.8 Assessment

Learning Outcome 4: The learner will be able to use appropriate measuring units, instruments and formulae in a variety of contexts.

Assessment Standard 4.5: We know this when the solves problems involving selecting, calculating with and converting between appropriate S.I. units listed above, integrating with appropriate Technology and Natural Sciences contexts.

3.13 To use appropriate measuring instruments[13]

3.13.1 MATHEMATICS

3.13.2 Measurement and Time

3.13.3 Area

3.13.4 EDUCATOR SECTION

3.13.5 Memorandum

A. 0,05 kg (50 g)
B. 0,35 kg (350 g)
C. 0,55 kg (550 g)
D. 0,9 kg (900 g)
E. 0,2 kg (200 g)
F. 0,7 kg (700 g)
G. 1,4 kg
H. 1,9 kg

3.13.6 LEANER SECTION

3.13.7 Content

3.13.7.1 ACTIVITY: To use appropriate measuring instruments [LO 4.6.1]

1. You should be able to read and interpret scales quite easily by now. Read the masses indicated on the following mass meters and write them down neatly.

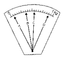

Figure 3.13

A. ____________________________________
B. ____________________________________
C. ____________________________________
D. ____________________________________

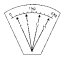

Figure 3.14

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[13] This content is available online at <http://cnx.org/content/m21080/1.1/>.

E. ___________________________________
F. ___________________________________
G. ___________________________________
H. ___________________________________

3.13.8 Assessment

Learning Outcome 4: The learner will be able to use appropriate measuring units, instruments and formulae in a variety of contexts.

Assessment Standard 4.6: We know this when the learner uses appropriate measuring instruments (with understanding of their limitations) to appropriate levels of precision including:

4.6.1: bathroom scales, kitchen scales and balances to measure mass.

3.14 To calculate by selecting appropriate operations for solving particular problems[14]

3.14.1 MATHEMATICS

3.14.2 Measurement and Time

3.14.3 Area

3.14.4 EDUCATOR SECTION

3.14.5 Memorandum

1. 14 856 kg – (235 + 39 kg)
   = 5 691 kg
   2. (10 000 kg – 9 165 kg) ÷ 39
   = 21,41
   = 21 bags

3.14.6 LEANER SECTION

3.14.7 Content

3.14.7.1 ACTIVITY: To calculate by selecting appropriate operations for solving particular problems [LO 1.8.2, LO 1.8.4]

3.14.7.2 To write number sentences to describe a problem situation [LO 2.4]

Do this work on your own. Read through the problems provided below and see whether you are able to find the solutions. Remember to use the number sentences! Also remember to show neat, clear operations and don't forget about the units.

1. A truck transports 235 bags of sand weighing 39 kg each. If the truck with its load weighs 14 856 kg, what is the mass of the truck without its load?

____
____
____
____
____
____

---

[14] This content is available online at <http://cnx.org/content/m21081/1.1/>.

2. It is a 10 ton truck (may transport a maximum of 10 tons). How many bags can still be loaded without exceeding the mass limit?

____

____

____

____

3.14.8 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.8: We know this when the learner estimates and calculates by selecting and using operations appropriate to solving problems that involve:

1.8.2: addition and subtraction of whole numbers;

1.8.4: multiplication of at least whole 4-digit by 3-digit numbers;

Learning Outcome 2: The learner will be able to recognise, describe and represent patterns and relationships, as well as to solve problems using algebraic language and skills.

Assessment Standard 2.4: We know this when the learner writes number sentences to describe a problem situation, including problems within contexts that may be used to build awareness of human rights, social, economic, cultural and environmental issues.

3.15 Performing mental calculations[15]

3.15.1 MATHEMATICS

3.15.2 Measurement and Time

3.15.3 Area

3.15.4 EDUCATOR SECTION

3.15.5 Memorandum

1. 0,2
2. 0,32
3. 2,17
4. 59,8
5. 5 980
6. 1,984
7. 39,6
8. 9,75
9. 4 700 mm
10. 10,5 ℓ
11. 6 m
12. 7,2 ℓ
13. 1,75 kg
14. 2 918 mℓ
15. 0,017 km

---

[15] This content is available online at <http://cnx.org/content/m21082/1.1/>.

3.15.6 LEANER SECTION

3.15.7 Content

3.15.7.1 ACTIVITY: Performing mental calculations [LO 1.9]

It is time to see if you can improve your skill in mental calculation! Apply the knowledge that you have already gained and note how quickly and accurately you are able to complete this mental calculation test.

1. 200 ÷ 1 000 = ____
2. 32 ÷ 100 = ____
3. 217 ÷ 100 = ____
4. 5,98 × 10 = ____
5. 59,8 × 100 = ____
6. 198,4 ÷ 100 = ____
7. Double 19,8 : ____
8. Halve 19,5 : ____
9. 5 m − 300 mm = ____
10. 12 ℓ − 1,5 ℓ = ____
11. 3,8 m + 2,2 m = ____
12. 2,4 ℓ × 3 = ____
13. of 3,5 kg = ____
14. 2,918 ℓ = ____ mℓ
15. 17 m = ____ km

3.15.8 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.9: We know this when the learner performs mental calculations.

3.16 To multiply with decimals[16]

3.16.1 MATHEMATICS

3.16.2 Measurement and Time

3.16.3 Area

3.16.4 EDUCATOR SECTION

3.16.5 Memorandum

1.
    - 1.1 5,76
    - 1.2 12 302,4
    - 1.3 70,08
    - 1.4 2,232
    - 1.5 1 412,64
    - 1.6 105,86

---

[16] This content is available online at <http://cnx.org/content/m21083/1.1/>.

1.7 238,1
1.8 15,7

3.16.6 LEANER SECTION

3.16.7 Content

3.16.7.1 ACTIVITY: To multiply with decimals

1. As you might have realised, working with decimal fractions forms an important part of this module. How good is your memory of what we have done in the previous module? Apply your memory and calculate the following without using a pocket calculator.

1.1 3,2 × 1,8 =

1.2 5 126 × 2,4 =

1.3 21,9 × 3,2 =

1.4 1,86 × 1,2 =

1.5 32,4 × 43,6 =

1.6 13,4 m × 7,9 m =

1.7 285,72 ÷ 1,2 =

____

____

1.8 2,355 ÷ 0,15 =

____

____

____

____

____

3.17 To solve problems that include converting between S.I. units[17]

3.17.1 MATHEMATICS

3.17.2 Measurement and Time

3.17.3 Content

3.17.4 EDUCATOR SECTION

3.17.5 Memorandum

1.1 3 000
1.2 0,003
1.3 30
1.4 147
1.5 1 200
1.6 29 804
1.7 1 507
1.8 300 000
1.9 19
1.10 250

3.17.6 LEANER SECTION

3.17.7 Content

Do you know the answers of the following?_______________________________________

- How much cool drink is there in a standard tin?__________________________________
- How much milk is there in the sachets at the supermarket?_______________________
- How much water can your geyser hold? ____
- How much yoghurt is there in the small containers?_____________________________

You have just given the capacity of the cool drink tin, milk sachet, geyser and yoghurt container.

The units for capacity are:

---

[17] This content is available online at <http://cnx.org/content/m21084/1.1/>.

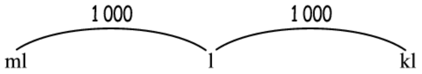

Figure 3.15

3.17.7.1 ACTIVITY: To solve problems that include converting between S.I. units [LO 4.5]

1. This activity should be like child's play! Let us see how well you can remember the work. Take a good look at the following and convert as required:

  1.1 3 ℓ = ___________________________ mℓ
  1.2 3 ℓ = ___________________________ kℓ
  1.3 0,03 ℓ = _________________________ mℓ
  1.4 0,147 kℓ = ________________________ ℓ
  1.5 1,2 kℓ = _________________________ ℓ
  1.6 29,804 ℓ = ________________________ mℓ
  1.7 1,507 kℓ = ________________________ ℓ
  1.8 300 ℓ = ___________________________ mℓ
  1.9 19 000 mℓ = _______________________ ℓ
  1.10 1 cup = ___________________________ mℓ

3.17.8 Assessment

Learning Outcome 4: The learner will be able to use appropriate measuring units, instruments and formulae in a variety of contexts.

Assessment Standard 4.5: We know this when the solves problems involving selecting, calculating with and converting between appropriate S.I. units listed above, integrating with appropriate Technology and Natural Sciences contexts.

3.18 To perform mental calculations[18]

3.18.1 MATHEMATICS

3.18.2 Measurement and Time

3.18.3 Content

3.18.4 EDUCATOR SECTION

3.18.5 Memorandum

1. 360
  2. 0,36
  3. 3
  4. 0,036
  5. 5,88

---

[18] This content is available online at <http://cnx.org/content/m21086/1.1/>.

6. 6
7. 6,6
8. 20
9. =
10. =
11. =
12. =
13. =
14. =
15. >

1 ℓ = 4 cups
1 teaspoon = 5 mℓ
1 cup = 50 teaspoons
1 medicine measure = 5/10 mℓ

3.18.6 LEANER SECTION

3.18.7 Content

3.18.7.1 ACTIVITY: To perform mental calculations [LO 1.9]

This is another opportunity to hone your mental calculation skills. Complete the following as quickly and accurately as possible.

1 3,6 × 100 = _______________________
2 3,6 ÷ 10 = ________________________
3 0,030 × 100 = _____________________
4 0,36 ÷ 10 = _______________________
5 3,42 + 2,46 = _____________________
6 3,75 + 2,25 = _____________________
7 10 - _______________________ = 3,4
8 10 ÷ 0,5 = ________________________
Fill in: =; >; <
9 3,4 km _________ 111 _________ 3 040 m
10 m _________ 111 _________ 63 cm
11 0,46 kg _________ 111 _________ 460 g
12 0,003 ℓ _________ 111 _________ 3 mℓ
13 km _________ 111 _________ 320 m
14 0,75 m _________ 111 _________ m
15 2 ℓ _________ 111 _________ 2,5 ℓ
Can you perhaps help?!
How many cups are there in 1 ℓ?____

- How many mℓ in one teaspoon? ____
- How many teaspoons in one cup?____
- How many mℓ in one medicine measure?__________________________________

3.18.8 Assessment

Learning Outcome 1:The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.9: We know this when the learner performs mental calculations

3.19 To use appropriate measuring instruments[19]

3.19.1 MATHEMATICS

3.19.2 Measurement and Time

3.19.3 Content

3.19.4 EDUCATOR SECTION

3.19.5 Memorandum

2. 2.1 A 0,05
   B 0,2
   C 0,4
   D 0,35
   2.2 E 1
   F
   3.
   A 0,3 ℓ
   B 0,7 ℓ
   C 1,2 ℓ
   D 1,8 ℓ
   E 0,2 ℓ
   F 0,8 ℓ
   G 1,4 ℓ
   H 1,4 ℓ
   I 0,15 ℓ
   J 0,45 ℓ
   K 0,75 ℓ
   L 1,2 ℓ
   M 0,25 ℓ
   N 0,625 ℓ
   O 1,75 ℓ
   P 2,375 ℓ
   1.
   1.1 11,7218 ℓ
   1.2 16,73 ℓ
   1.3 107,15 mℓ
   1.4 4 123 kℓ
   1.5 102,76 m
   1.6 123 kℓ

3.19.6 LEANER SECTION

3.19.7 Content

3.19.7.1 ACTIVITY: To use appropriate measuring instruments [LO 4.6.2]

1. Let's talk about measuring jugs!
   1.1 For what reason might your mother or father use a measuring jug at home?
   ____

---

[19] This content is available online at <http://cnx.org/content/m21087/1.1/>.

____

____

____

1.2 What are the units in which a measuring jug is marked?

____

1.3 Do measuring jugs come in different sizes? If so, what are the sizes?

____

2. Study the following measuring jugs and take down the readings.

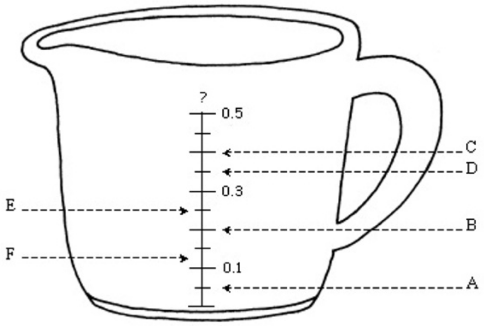

Figure 3.16

2.1 Express the measurements for A, B, C and D in litres (ℓ):
A ____________________________ ℓ
B ____________________________ ℓ
C ____________________________ ℓ
D ____________________________ ℓ
2.2 Express the measurements at E and F in cups:
E ____________________________ cups
F ____________________________ cups
3. Study the measuring jars and take the readings.

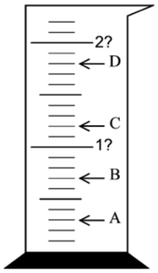

Figure 3.17

A. ______________________
B. ______________________
C. ______________________
D. ______________________

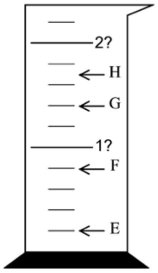

Figure 3.18

E. ______________________
F. ______________________
G. ______________________
H. ______________________

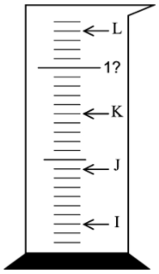

Figure 3.19

I. ______________________
J. ______________________
K. ______________________
L. ______________________

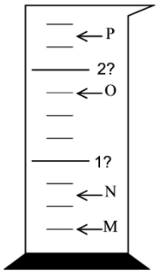

Figure 3.20

M. ____________________
N. _____________________
O. _____________________
P. _____________________

3.19.8 Assessment

Learning Outcome 4:The learner will be able to use appropriate measuring units, instruments and formulae in a variety of contexts.

Assessment Standard 4.6: We know this when the learner uses appropriate measuring instruments (with understanding of their limitations) to appropriate levels of precision including:

4.6.2: measuring jugs to measure capacity.

3.20 To calculate by using S.I.(Systéme Internationale) units[20]

3.20.1 MATHEMATICS

3.20.2 Measurement and Time

3.20.3 Content

3.20.4 EDUCATOR SECTION

3.20.5 Memorandum

1.

1.1 643 km ÷ 50 = 12,86 km
1.2 2 575 ℓ ÷ 125 ℓ = 20,6 = 20 fulll drums
1.3 37,5 mℓ × 275 = 10 312,5 mℓ = 10,3125 ℓ
1.4 538 900 ℓ - 98 476 ℓ = 440 424 ℓ = 440,424 kℓ
1.5 900 mℓ + 300 mℓ + 480 mℓ + 1 140 mℓ
1.6 = 2 820 mℓ = 2,820 ℓ

---

[20] This content is available online at <http://cnx.org/content/m21090/1.1/>.

3.20.6 LEANER SECTION

3.20.7 Content

3.20.7.1 ACTIVITY: To calculate by using S.I.(Systéme Internationale) units [LO 4.5]

1. Calculate the following without the use of a pocket calculator. Work neatly and show all operations. Do not forget to indicate the unit.

1.1 1,247 $\ell \times 9{,}4 =$

_ _

_ _

_ _

_ _

_ _

_ _

1,2 836,50 $\ell \div 50 =$

_ _

_ _

_ _

_ _

_ _

_ _

1.3 2,143 m$\ell \times 50 =$

_ _

_ _

_ _

_ _

_ _

_ _

1.4 1 236,90 k$\ell \div 0{,}3 =$

_ _

_ _

_ _

_ _

_ _

_ _

1.5 2,569 m $\times$ 40 = ...

_ _

_ _

_ _

_ _

_ _

_ _

1.6 36,90 k$\ell \div 0{,}3 =$

_ _

_ _

_ _

_ _

_ _

_ _

3.20.8 Assessment

Learning Outcome 4:The learner will be able to use appropriate measuring units, instruments and formulae in a variety of contexts.

Assessment Standard 4.5: We know this when the learner solves problems involving selecting, calculating with and converting between appropriate S.I. units listed above, integrating with appropriate Technology and Natural Sciences contexts.

3.21 To investigate and approximate[21]

3.21.1 MATHEMATICS

3.21.2 Measurement and Time

3.21.3 Length

3.21.4 EDUCATOR SECTION

3.21.5 Memorandum

3.21.6 LEANER SECTION

3.21.7 Content

3.21.7.1 ACTIVITY: To solve problems in context [LO 1.6.2]

1. Your educator will provide the required paper. Examine the diagram below and copy it exactly. Try to construct your own cube from this.

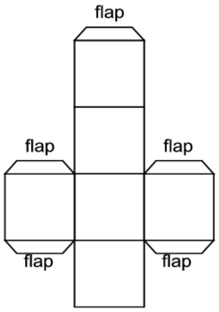

Figure 3.21

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[21] This content is available online at <http://cnx.org/content/m21109/1.1/>.

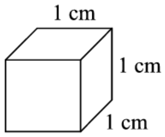

Figure 3.22

- You now have a container with the following measurements:

1 cm by 1 cm by 1 cm

- We therefore say that the volume of the container is:

1 cm × 1 cm × 1 cm = 1 cm3
(one cubic centimetre)
volume = length × width × height
2. How many of these boxes (of 1 cm^3) will you need to build a cube of 8 cm^3? (2 cm × 2 cm × 2 cm)

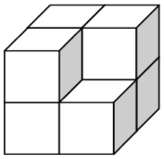

Figure 3.23

2.1 8 cm3 = (2 cm × 2 cm × 2 cm): _____________________ cubes
2.2 27 cm3 = (3 cm × 3 cm × 3 cm): ____________________ cubes
2.3 64 cm3 = (4 cm × 4 cm × 4 cm): ____________________ cubes
2.4 125 cm3 = (5 cm × 5 cm × 5 cm): ___________________ cubes

3.21.8 Assessment

Learning Outcome 4:The learner will be able to use appropriate measuring units, instruments and formulae in a variety of contexts.

Assessment Standard 4.8: We know this when the learner investigates and approximates (alone and/or as a member of a group or team):

4.8.3: volume/capacity of objects (by packing or filling them) in order to develop rules for calculating volume of rectangular prisms.

3.22 To solve problems in context[22]

3.22.1 MATHEMATICS

3.22.2 Measurement and Time

3.22.3 Volume

3.22.4 EDUCATOR SECTION

3.22.5 Memorandum

1.
    1.1 3 cm × 2 cm × 2 cm = 12 cm^3
    3 cm × 2 cm × 3 cm = 18 cm^3
    1 cm × 4 cm × 3 cm = 12 cm^3
    1.2 5 m × 3,5 m × 2 m = 35 m^2
    1.3 9 cm × 6 cm × 2 cm = 108 cm^2
    2. 2.1 577 912 cm^2
    2.1 583 296 cm^2
    3. (78 cm × 46 cm × 52 cm) ÷ (24 cm × 8 cm × 11 cm)
    = 186 576 cm^2 ÷ 2 112 cm^2
    = 88,34
    = 88 small boxes

3.22.6 LEANER SECTION

3.22.7 Content

3.22.7.1 ACTIVITY: To solve problems in context [LO 1.6.2]

1. Calculate the volume of the following:
    1.1

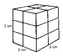

Figure 3.24

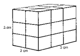

Figure 3.25

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[22] This content is available online at <http://cnx.org/content/m21091/1.1/>.

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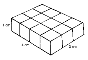

Figure 3.26

____

1.2 A swimming pool 5 m long, 3,5 m wide and 2 m deep.

____

____

____

____

1.3 A tin of tuna: 9 cm by 6 cm by 2 cm.

____

____

____

____

2. Which container has the biggest volume:

2.1: 106 cm by 94 cm by 58 cm, or

____

2.2: 93 cm by 98 cm by 64 cm?.

____

____

3. How many small boxes with the measurements 24 cm × 8 cm × 11 cm can you pack into a big box of 78 cm by 46 cm by 52 cm?

____

____

____

____

3.22.8 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.6: We know this when the learner solves problems in context including contexts that may be used to build awareness of other Learning Areas, as well as human rights, social, economic and environmental issues such as:

1.6.2: measurements in Natural Sciences and Technology contexts.

3.23 To perform mental calculations[23]

3.23.1 MATHEMATICS

3.23.2 Measurement and Time

3.23.3 Volume

3.23.4 EDUCATOR SECTION

3.23.5 Memorandum

1. 100
2. 10 000
3. 4
4. 8
5. 27
6. 125
7. 9
8. 4
9. 2
10. 20
11. 9
12. 3
13. 7
14. 100 + 100 000 = 100 100
15. 22

3.23.6 LEANER SECTION

3.23.7 Content

3.23.7.1 ACTIVITY: To perform mental calculations [LO 1.9]

By this time you should be quite bright and quick when working with numbers. Let's see how you perform in the next mental calculation test! Try to complete it within three minutes:

1. 102 = _________________________
2. 104 = _________________________
3. 22 = _________________________
4. 23 = _________________________
5. 33 = _________________________
6. 53 = _________________________
7. _________________________2 = 81
8. _________________________.3 = 64
9. 3 × 5 × _________________________ = 30
10. 0,3 × 5 × _________________________ = 30
11. 3 × _________________________ = 27
12. 3_________________________ = 27
13. 102 × 105 = 10_________________________
14. 102 + 105 = _________________________
15. 29 × 22 = (30 × 22) – _____________________

---

[23] This content is available online at <http://cnx.org/content/m21094/1.1/>.

3.23.8 Assessment

Learning Outcome 1:The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.9: We know this when the learner performs mental calculations.

3.24 To read analogue time and write 24-hour time[24]

3.24.1 MATHEMATICS

3.24.2 Measurement and Time

3.24.3 Time

3.24.4 EDUCATOR SECTION

3.24.5 Memorandum

1.
    1.1 07.30
    1.2 21.15
    1.3 05.50
    1.4 22.40
    1.5 19.00

3.24.6 LEANER SECTION

3.24.7 Content

- At what time did you go to bed last night?

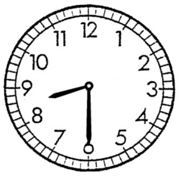

Figure 3.27

Half past eight?

---

[24] This content is available online at <http://cnx.org/content/m21097/1.1/>.

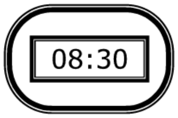

Figure 3.28

Eight thirty?

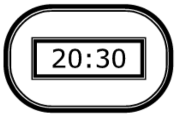

Figure 3.29

Twenty thirty?
Do you still remember?
60 s (seconds) = 1 min (minute)
60 min = 1 h (hour)
24 h = 1 d (day)
7 d = 1 wk (week)
365 d = 1 a (year)
366 d = 1 leap year
52 wks (approximately) = 1 a
12 months = 1 a
100 a = 1 century

3.24.7.1 ACTIVITY: To read analogue time and write 24-hour time [LO 4.1]

1. In Grades 4 and 5 you did quite a lot of work involving time. Let's see whether you are able to apply your knowledge. Write the following according to the international system of writing.
1.1 half past seven (a.m.) è ________:________
1.2 quarter past nine (p.m.) ________:________
1.3 ten to six (a.m.) ________:________
1.4 twenty to eleven (p.m.) ________:________
1.5 seven o'clock (p.m.) è ________:________

3.24.8 Assessment

Learning Outcome 4:The learner will be able to use appropriate measuring units, instruments and formulae in a variety of contexts.

Assessment Standard 4.1: We know this when the reads, tells and writes analogue, digital and 24-hour time to at least the nearest minute and second.

3.25 To solve problems involving operations and conversion of time units[25]

3.25.1 MATHEMATICS

3.25.2 Measurement and Time

3.25.3 Time

3.25.4 EDUCATOR SECTION

3.25.5 Memorandum

1.1 2 h 16 min = 18 h 8 min
2 h 16 min + 15 h 52 min = 17 h 68 min
1.2 15 h - 8 h 27 min = 6 h 33 min
15 h 00 min - 8 h 27 min = 6 h 33 min
1.3 8 h 6 min - 2 h 45 min = 5 h 21 min
8 h 06 min – 2 h 45 min = 5 h 21 min
1.4 12 × 3 h 48 min = 45 h 36 min
12 × 3 h 48 min = 36 h 576 min
1.5 4 h 30 min ÷ 15 min = 18
270 min ÷ 15 min
2.1 16 h 10 min – 10 h 00 min = 6 h 10 min
6 h 10 min – 50 min = 5 h 20 min
a) 1 h 30 min
b) 35 min
c) 6 h 5 min
d) 4 h

3.25.6 LEANER SECTION

3.25.7 Content

3.25.7.1 ACTIVITY: To solve problems involving operations and conversion of time units [LO 4.2]

We are also going to check whether you still remember how to add and subtract when working with time.

1. Calculate the following:

1.1 2 h 16 min + 15 h 52 min = ____________h____________min

____

____

____

1.2 15 h – 8 h 27 min = ____________h____________min

____

____

____

1.3 8 h 6 min – 2 h 45 min = ____________h____________min

---

[25] This content is available online at <http://cnx.org/content/m21098/1.1/>.

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____

____

1.4 12 × 3 h 48 min = _____________h_____________min

____

____

____

1.5 4 h 30 min ÷ 15 min = ______________________________

____

____

____

2. Write clear number sentences to solve the following problems:

2.1 A cricket match started at 10:00 and stopped at 16:10. How much time was spent on the game if there were two rest periods of 10 minutes each and a lunch period of 30 minutes?

____

____

____

____

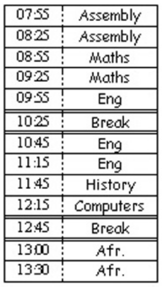
2.2 The following is Gerda's class timetable for Mondays.

a) How much time is spent on English?____

b) How long are the breaks in total?____

c) How long is the school day?____

d) If she has 9 Afrikaans periods per week, how much time is spent in Afrikaans? ____



07:55	Assembly
08:25	Assembly
08:55	Maths
09:25	Maths
09:55	Eng
10:25	Break
10:45	Eng
11:15	Eng
11:45	History
12:15	Computers
12:45	Break
13:00	Afr.
13:30	Afr.

Figure 3.30

3.25.8 Assessment

Learning Outcome 4:The learner will be able to use appropriate measuring units, instruments and formulae in a variety of contexts.

Assessment Standard 4.2: We know this when the solves problems involving calculations between appropriate time units, including time zones and differences.

3.26 To solve problems involving time units[26]

3.26.1 MATHEMATICS

3.26.2 Measurement and Time

3.26.3 Time

3.26.4 EDUCATOR SECTION

3.26.5 Memorandum

3.26.6

1. 4 h 40 min + 24 h + 16 h 30 = 49 h 10 min
2. 45 min × 7 = 315 min = 5 h 15 min
3. 08:05
4. 81 + 365 + 366 + 365 + 365 + 365 + 360 + 52 + 2 325 days
5. 35 km in 20 min
× = 3 × 35 = 105 km/h
6. 2 × 110 km = 275 km
7.1 50 min
7.2 190 min = 3 h 10 min
7.3 Yes
7.4 10:00 and 13:15
7.5 18h00

3.26.7 LEANER SECTION

3.26.8 Content

3.26.8.1 ACTIVITY: To solve problems involving time units [LO 4.2]

Work with a partner. Read each problem carefully and then solve it as neatly and accurately as possible.

1. Johan leaves on an excursion at 15:20 on Friday. He arrives back at home at 16:30 on Sunday. How long was he gone?

____
____
____
____

2. Heleen practises on her violin for 45 min every day. For how many hours and minutes does she practise every week?

____
____
____
____

3. An aeroplane departs for London at 19:40 and lands at Heathrow airport 12 h 25 min later. At what time does the plane land?

____
____
____
____

---

[26] This content is available online at <http://cnx.org/content/m21101/1.1/>.

4. If Marius was born on 11 October 1962 and John on 21 February 1969, how much older is Marius than John?

_ _
_ _
_ _
_ _

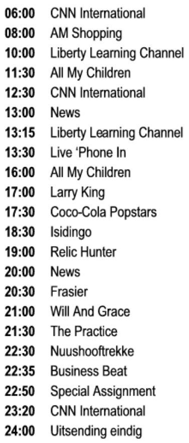
5. If it takes me 20 min to cover 35 km at a constant speed, what is my speed? (km/h)

_ _
_ _
_ _
_ _

6. Mr Voges travels at a constant speed of 110 km/h. How far will he drive in 2 h?

_ _
_ _
_ _
_ _

7. Study the TV programme timetable for SABC3:



06:00	CNN International
08:00	AM Shopping
10:00	Liberty Learning Channel
11:30	All My Children
12:30	CNN International
13:00	News
13:15	Liberty Learning Channel
13:30	Live 'Phone In
16:00	All My Children
17:00	Larry King
17:30	Coco-Cola Popstars
18:30	Isidingo
19:00	Relic Hunter
20:00	News
20:30	Frasier
21:00	Will And Grace
21:30	The Practice
22:30	Nuushooftrekke
22:35	Business Beat
22:50	Special Assignment
23:20	CNN International
24:00	Uitsending eindig

Figure 3.31

7.1 How much time in total is devoted to the news? _
7.2 How much time is devoted to international business news?_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
7.3 Are there any educational programmes? _
7.4 At what times?_ _
7.4 For how long does SABC3 broadcast every day?_ _
ASSESSMENT BY EDUCATOR:
Circle the applicable code:

NUMBER CORRECT	CODE
12 - 34 - 56 - 7	1234

Table 3.13

3.26.9 Assessment

Learning Outcome 4:The learner will be able to use appropriate measuring units, instruments and formulae in a variety of contexts.

Assessment Standard 4.2: We know this when the solves problems involving calculations between appropriate time units, including time zones and differences.

3.27 To record temperature using degrees Celsius[27]

3.27.1 MATHEMATICS

3.27.2 Measurement and Time

3.27.3 Temperature

3.27.4 EDUCATOR SECTION

3.27.5 Memorandum

1. Temperature
   2. 180 °C
   4. 100 °C
   6. 38 °C
   7. 0 °C
   1.1 –4 °C
   1.2 25 °C
   1.3 –12 °C
   1.4 38 °C
   1.5 –18 °C
   1.6 –10 °C
   2.1 38 °C
   2.2 -18 °C
   3.1 10 °C
   3.2 8 °C
   3.3 6 °C
   3.4 7 °C
   3.5 –3 °C
   4. 6,5 °C; 12,5 °C; 1 °C
   ASSESSMENT: MEASURING
   1.1 375 mℓ
   1.2 0,62 kg
   1.3 0,1
   1.4 5 000
   1.5 2 m
   2.1 <
   2.2 >
   2.3 <
   2.4 <

---

[27] This content is available online at <http://cnx.org/content/m21105/1.1/>.

2.5 $>$
3.1 $l \times b \times h$
3.2 (1 m $\times$ 1 m $\times$ 1 m) + (2 m $\times$ 2 m $\times$ 3 m)
= 1 m^3 + 12 m^3
= 13 m^3
4.1 5 °C
23 °C
19 °C
4.2 1 380 $\div$ 120 = 11,5
11 $\frac{1}{2}h$
4.3 (43 + 41,4 + 39,8 + 42 + 41,2) $\div$ 5
= 207,4 $\div$ 5
= 41,48 °C
5.1 300 cm $\times$ 400 cm
3 m $\times$ 4 m
5.2 3 m $\times$ 4 m = 12 m^2
5.3 W (12 $\times$ 8) + (16 $\times$ 2) + (10 $\times$ 2) = 148
S 28 + 16 = 44
5.4 $\frac{44}{148} = \frac{11}{37}$
6. 7 $\frac{1}{2}$ $\times$ 4 cm^2
= 30 cm^2
7.1 (175 mm $\times$ 6) + (32 mm $\times$ 2) + 145 mm
= 1 835 mm
= 1,835 m
7.2 3,165 m
8.1 (18 $\times$ 4) + (12 $\times$ 2) = 96
8.2 40 min + 24 h + 6 h 15 min
= 30 h 55 min

3.27.6 LEANER SECTION

3.27.7 Content

Let's begin by looking at some general questions.

- With what instrument do we measure temperature?_____________________________
- At what temperature does your mother usually bake a cake?_________________o C
- What is the temperature of your bath water? ±____________________________o C
- What is the temperature of boiling water? ±____________________________o C
- What was the temperature on the hottest day last summer?__________________o C
- What is the body temperature of a healthy person? ±_____________________o C
- What temperature is the freezing point of water?____________________________o C

DO YOU REMEMBER THIS?
°C

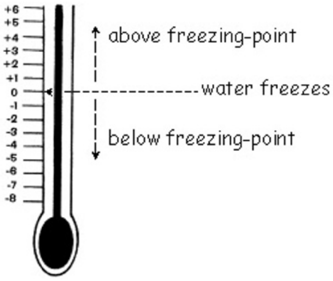
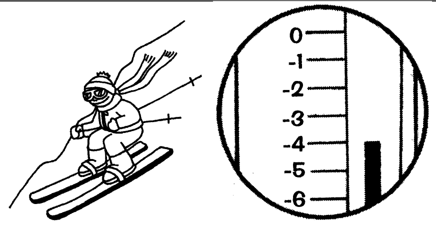


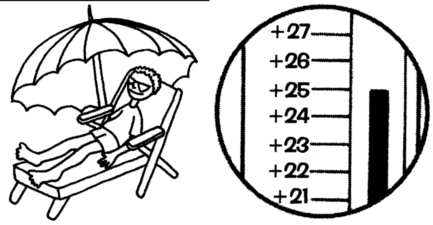
Figure 3.32

3.27.7.1 ACTIVITY: To record temperature using degrees Celsius [LO 4.4.4, LO 4.6.4]

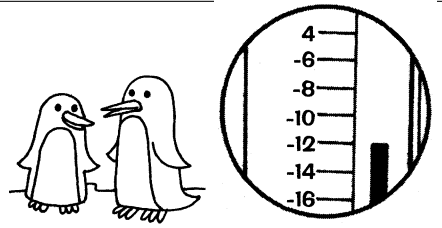
1. Read the temperature on each of the following thermometers.



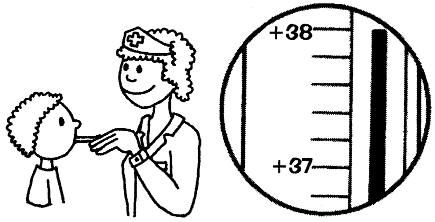
1.1_______



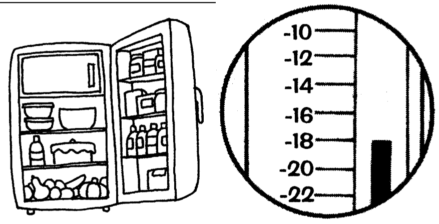
1.2_______



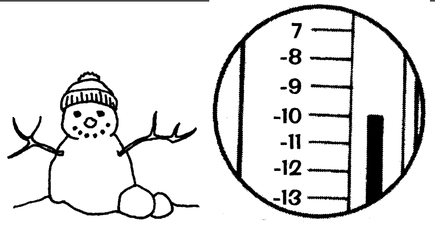
1.3_______



1.4_______



1.5_______



1.6_______

Table 3.14

2. Which temperature is:

2.1 the highest: ___________________________________

2.2 the lowest: ___________________________________

3. What will the thermometer indicate if the temperature:

3.1 rises by 8 degrees from +2 ºC? ___________________________________
3.2 rises by 12 degrees from –4 ºC? ___________________________________
3.3 rises by 7 degrees from –1 ºC? ___________________________________
3.4 drops by 11 degrees from 18 ºC? ___________________________________
3.5 drops by 10 degrees from 7 ºC? ___________________________________
4. What is the reading on the following thermometers?

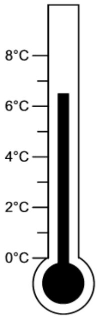


Figure 3.33

____

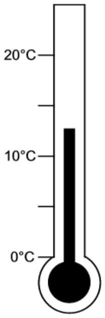


Figure 3.34

____

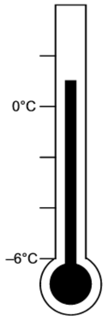


Figure 3.35

____

ASSESSMENT: MEASURING

1. Complete

1.1 ℓ = ____________________________ mℓ

1.2 2,480 kg ÷ 4 = ____________________________ kg

1.3 360 ÷ (____________________________ × 90) = 40

1.4 (20 × 102) + (3 × 103) = ____________________________

1.5 25 % of 8 m = ____________________________ m

2. Fill in >; <; =

2.1 0,015 m * 15 cm

2.2 1,37 kg * 137 g

2.3 1 m * 1 775 mm

2.4 72 min * 1 h

2.5 5 cups * 1 ℓ

3.

3.1 Write down a formula for calculating the volume of a cube.

____

3.2 Now use this formula to determine the volume of the following shape:

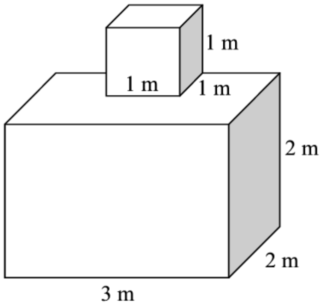


Figure 3.36

____
____
____
____
____
____
____
____

4. Study the map of South Africa.

4.1 What is the difference between the minimum and maximum temperatures predicted for:

Cape Town? ____________________o C
Sutherland? ____________________o C
Still Bay? ____________________o C

4.2 The distance between Cape Town and Johannesburg is 1 380 km.

If Mr Fourie travels this distance at an average speed of 120 km/h, how long will it take him to reach his destination?

____
____
____
____

4.3 During January Durban experienced a heat wave. The maximum temperatures for five subsequent days were:

Mon: 43o C
Tue: 41,4 o C
Wed: 39,8 o C
Thu: 42 o C
Fri: 41,2o C

What was the average maximum for these five days?

____
____
____
____

5. Mrs Marais wants to tile her bathroom in the following pattern.

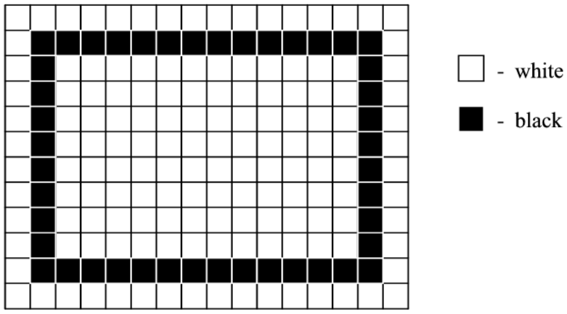


Figure 3.37

Each tile is square, with a side of 25 cm..

5.1 What are the measurements of the bathroom?

____

____

____

____

5.2 What is the area of the bathroom (in m2)?

____

____

____

____

5.3 How many white and black tiles respectively must Mrs Marais buy? (The sketch only illustrates the pattern, and not the number of tiles).

____

____

____

____

5.4 Express the black tiles as a fraction of the white tiles (simplify if possible).

____

____

____

____

6. If each square in the following figure is 2 cm by 2 cm, calculate the size of the area that is coloured in.

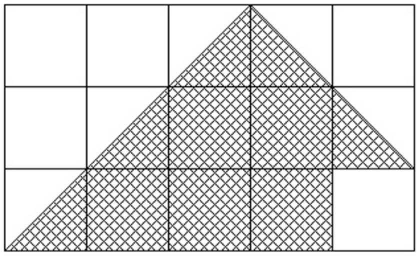


Figure 3.38

____
____
____
____
____
____
____
____

7. A gift is decorated with ribbon.

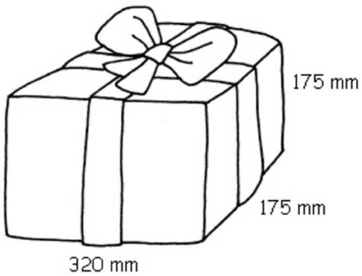


Figure 3.39

7.1 Calculate the total length of the ribbon used if 14,5 cm was used for the bow alone.

____
____
____
____
____

7.2 How much ribbon is left over if 5 m of ribbon was bought?

____
____
____

8. The Blue Train departs from Cape Town for Johannesburg.
There are 18 compartments (maximum 4 persons) and 12 coupes (maximum 2 persons).

8.1 What is the maximum number of passengers that can be accommodated?

_ _
_ _
_ _

8.2 The train departs on Tuesday at 23:20 from Cape Town and arrives on Thursday at 06:15 in Johannesburg. What is the duration of the journey?

_ _
_ _
_ _
_ _
_ _

TOTAL: 40

Chapter 4

Term 4

4.1 Recognising and describing angles[1]

4.1.1 MATHEMATICS

4.1.2 Geometry

4.1.3 Volume

4.1.4 EDUCATOR SECTION

4.1.5 Memorandum

Do you remember what the word **parallel** means? Write down the definition for it:

Invariable
1. A: Yes
B: Yes
2. C
1.
1.1 Obtuse
1.2 Right angle
1.3 Rotation
1.4 Acute
BRAIN-TEASER!
1. Acute
Obtuse
Straight
Right angle
2. Class discussion:

4.1.6 LEANER SECTION

4.1.7 Content

Do you remember what the word parallel means? Write down the definition for it:

____
____
____

---

[1] This content is available online at <http://cnx.org/content/m21117/1.1/>.

Let's begin with some "puzzles"!
Look at the sketches below and answer the questions that follow:

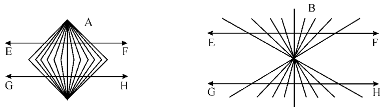


Figure 4.1

1. Indicate whether EF and GH are parallel to one another in figure
A: ____
B: ____
2. Which is the extension of F: C or K?

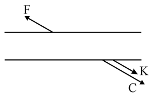


Figure 4.2

Do you still remember?

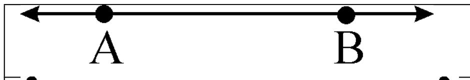
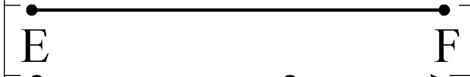
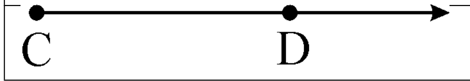
	indicates a line: AB
	indicates a line segment: EF
	indicates a radius: CD

Table 4.1

Two lines that intersect form an angle.

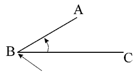


Figure 4.3

The point where the lines meet is called the vertex.
We write this as: ÐABC

- Did you know?

The unit that we use for measuring angles is a degree. We measure the size of the angle in degrees. We write an angle of 60 degrees as 60 °. You have to learn the different types of angles:

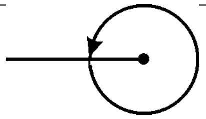
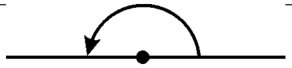
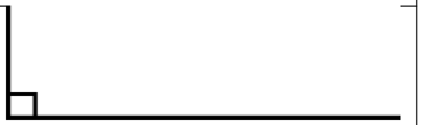
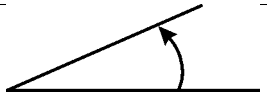
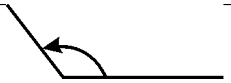
Types of angles	
1. The size of a **rotation** or full turn is 360 °	
2. A **straight angle** is a half turn and it is 180 °.	
3. A **right angle** is a quarter turn and it is 90 °.	
4. An **acute angle** is larger that 0 °, but smaller than 90 °.	
5. An **obtuse angle** is larger than 90 °, but smaller than 180 °.	

Table 4.2

4.1.8 ACTIVITY: Recognising and describing angles [LO 4.11]

1. How well do you know angles?
   Work with a partner to see if the two of you can tell what the following angles are:

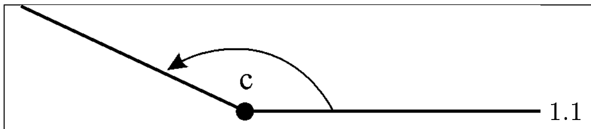
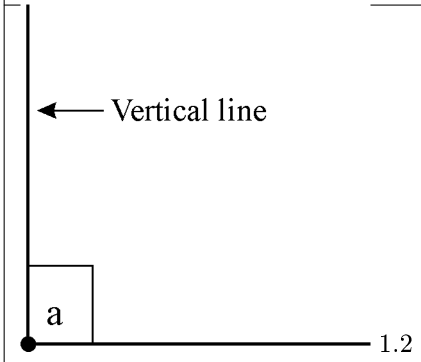
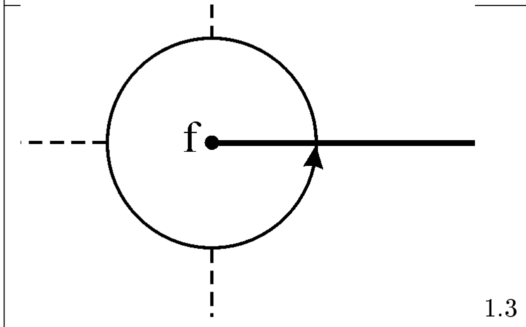
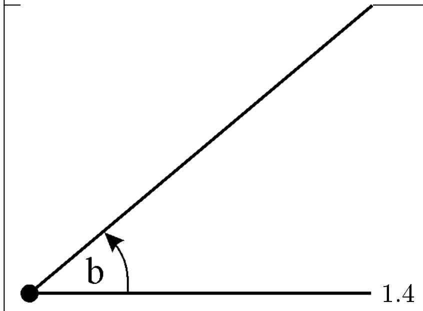

_ _

_ _

_ _

_ _

Table 4.3

4.1.8.1

4.1.8.2 Assessment

Learning Outcome 4:The learner will be able to use appropriate measuring units, instruments and formulae in a variety of contexts.

Assessment Standard 4.11: We know this when the learner recognises and describes angles in two-dimensional shapes, three-dimensional objects and the environment.

4.2 Recognising and describing angles[2]

4.2.1 MATHEMATICS

4.2.2 Geometry

4.2.3 Volume

4.2.4 EDUCATOR SECTION

4.2.5 Memorandum

4.2.6 LEANER SECTION

4.2.7 Content

4.2.7.1 ACTIVITY: Recognising and describing angles [LO 4.11]

1. BRAIN-TEASER!
   Work with a partner. Examine the picture. What
   are the different types of angles that you see?
   Where are they?
   Tell the rest of the class about your answers!

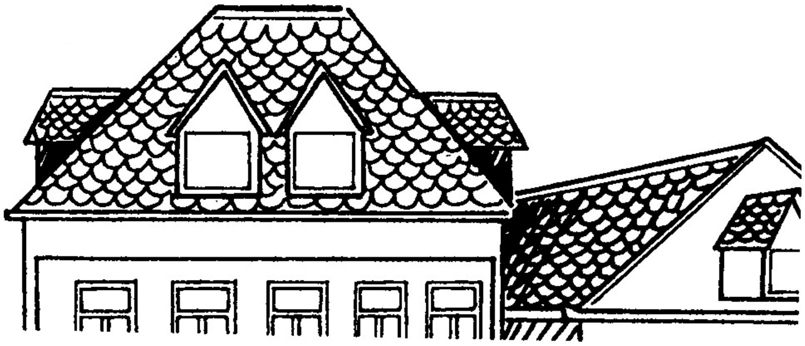


Figure 4.4

2. Class discussion:

- What can we use to measure angles accurately?
- Take a good look at the sketch - or at your own protractor.
- How do we use the protractor to measure angles?

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[2] This content is available online at <http://cnx.org/content/m21118/1.1/>.

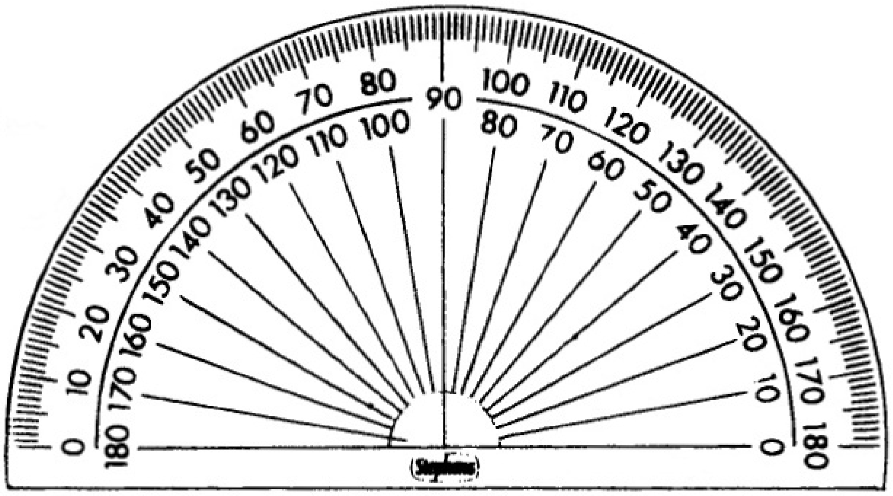


Figure 4.5

4.2.8 Assessment

Learning Outcome 4:The learner will be able to use appropriate measuring units, instruments and formulae in a variety of contexts.

Assessment Standard 4.11: We know this when the learner recognises and describes angles in two-dimensional shapes, three-dimensional objects and the environment.

4.3 To recognise and describe angles[3]

4.3.1 MATHEMATICS

4.3.2 Geometry

4.3.3 Volume

4.3.4 EDUCATOR SECTION

4.3.5 Memorandum

1.
    1.1 52º
    1.2 130º
    1.3 90º
    1.4 28º
    2.
    2.1 Acute
    2.2 Acute

---

[3] This content is available online at <http://cnx.org/content/m21121/1.1/>.

2.3 Acute
2.4 Obtuse

4.3.6 LEANER SECTION

4.3.7 Content

4.3.7.1 ACTIVITY: To recognise and describe angles [LO 3.2.3, LO 4.11]

1. Use your protractor to measure the following angles. Then explain what type of angle each one is.
   1.1

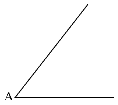


Figure 4.6

1.2

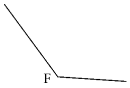


Figure 4.7

1.3

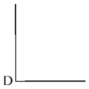


Figure 4.8

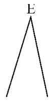
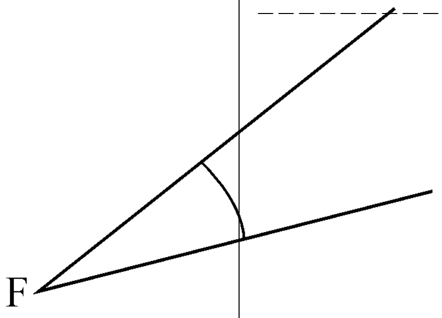
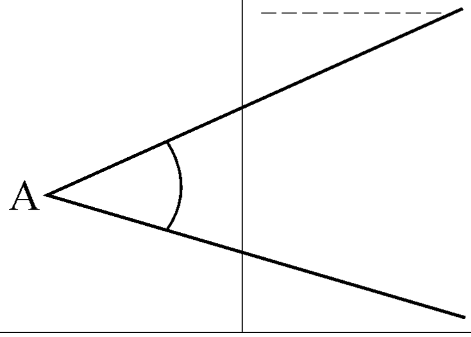


Figure 4.9

1.4

2. Complete the table. First estimate the sizes of the angles and then measure them accurately.

	Angle	Estimated	Measured	Type of angle
2.1		----------	----------	----------
2.2		----------	----------	----------

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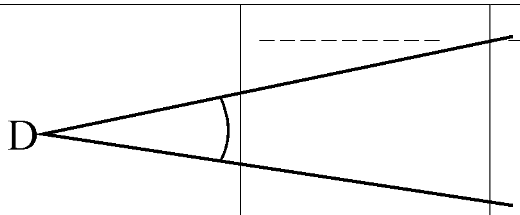
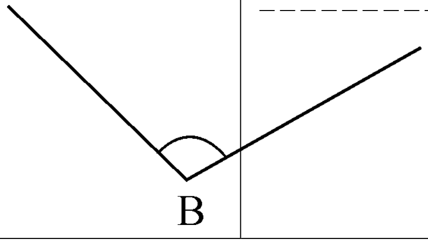
2.3		__________	__________	__________
3.2.4		__________	__________	__________

Table 4.4

4.3.8 Assessment

Learning Outcome 3:The learner will be able to use appropriate measuring units, instruments and formulae in a variety of contexts.

Assessment Standard 3.2: We know this when the learner describes and classifies two-dimensional shapes and three-dimensional objects in terms of properties including:

3.2.3: angle size of corners;

Learning Outcome 4:The learner will be able to use appropriate measuring units, instruments and formulae in a variety of contexts.

Assessment Standard 4.11: We know this when the learner angles smaller than right angles.

4.4 To recognise and name 2-dimensional figures[4]

4.4.1 MATHEMATICS

4.4.2 Geometry

4.4.3 Volume

4.4.4 EDUCATOR SECTION

4.4.5 Memorandum

1.1 parallelogram
1.2 trapezium
1.3 right angle
1.4 rhombus
1.5 kite
1.6 quadrangle
1.7 trapezium
1.8 square

Let's do revision!

---

[4] This content is available online at <http://cnx.org/content/m21123/1.1/>.

- When do we say that a figure is symmetrical?

Centre line reflected

- Which of the above figures are symmetrical?

1.3 / 1.4 / 1.5 / 1.8

4.4.6 LEANER SECTION

4.4.7 Content

4.4.7.1 ACTIVITY: To recognise and name 2-dimensional figures [LO 3.1.1, LO 3.1.2]

1. Class discussion:
   Can you give the names for the following figures? Work with a partner and write down all the names:

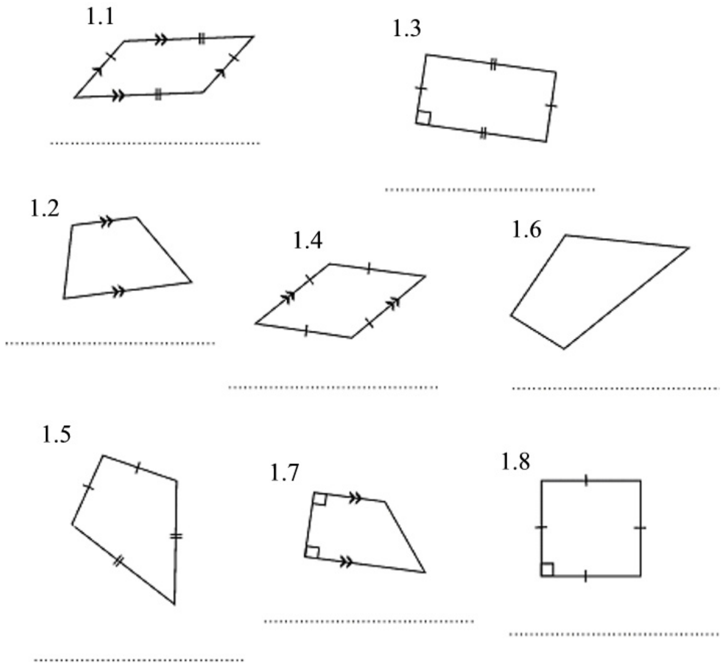


Figure 4.10

4.4.8 Assessment

Learning Outcome 3:The learner will be able to describe and represent characteristics and relationships between two-dimensional shapes and three-dimensional objects in a variety of orientations and positions.

Assessment Standard 3.1: We know this when the learner recognises, visualises and names two-dimensional shapes and three-dimensional objects in natural and cultural forms and geometric settings, including those previously dealt with and focusing on:

3.1.1: similarities and differences between tetrahedrons and other pyramids;
3.1.2: similarities and differences between rectangles and parallelograms.

4.5 To describe 2-dimensional figures in terms of different properties[5]

4.5.1 MATHEMATICS

4.5.2 Geometry

4.5.3 EDUCATOR SECTION

4.5.4 Memorandum

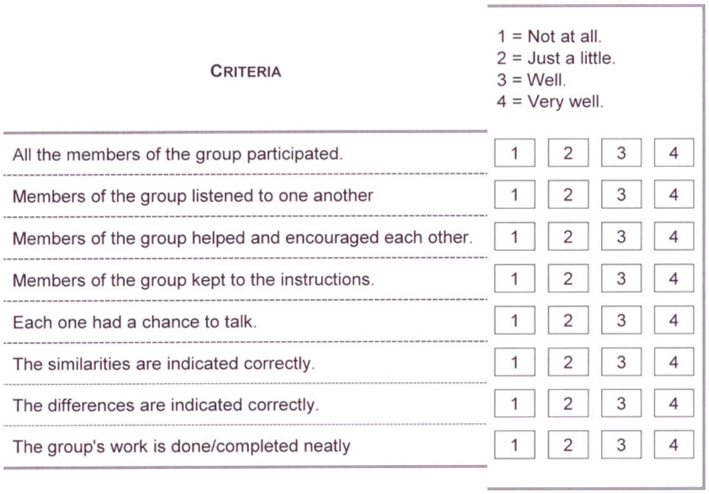
4.5.5 Learner Section

4.5.6 Content

1. Have a class discussion on the properties of each of the figures given above with regard to the following:
   (i) Number of sides and lengths
   (ii) Number of angles, types of angles and sizes
   (iii) Number of vertices

2. Work in groups of three. Choose any two of the above figures, e.g. a rectangle and a parallelogram. Design a poster on which you set out the differences and similarities of the two figures neatly. Display the poster so that the rest of the learners in the class can see it.

Evaluate your work on a scale 1 – 4 by circling the appropriate number:



CRITERIA	1 = Not at all. 2 = Just a little. 3 = Well. 4 = Very well.			
All the members of the group participated.	1	2	3	4
Members of the group listened to one another	1	2	3	4
Members of the group helped and encouraged each other.	1	2	3	4
Members of the group kept to the instructions.	1	2	3	4
Each one had a chance to talk.	1	2	3	4
The similarities are indicated correctly.	1	2	3	4
The differences are indicated correctly.	1	2	3	4
The group's work is done/completed neatly	1	2	3	4

Figure 4.11

Let's do rivision!

- When do we say that a figure is **symmetrical?**

---

[5] This content is available online at <http://cnx.org/content/m31671/1.1/>.

____

- Which of the above figures are **symmetrical?**

____

DID YOU KNOW?

A design that fits into its outlines more than once, has rotational symmetry. The number of times that a design fits into its own outlines is referred to as the order of symmetry.

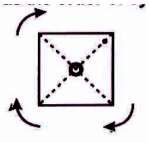


Figure 4.12

4.5.7 Assessment

Learning Outcome 3: The learner will be able to use appropriate measuring units, instruments and formulae in a variety of contexts.

Assessment Standard 3.2: We know this when the learner describes and classifies two-dimensional shapes and three-dimensional objects in terms of properties.

4.6 To use the vocabulary and properties of rotations to describe the relationships between 2-D shapes[6]

4.6.1 MATHEMATICS

4.6.2 Geometry

4.6.3 Volume

4.6.4 EDUCATOR SECTION

4.6.5 Memorandum

1. 1.1 2
   1.2 6
   2. 2.1 Yes
   2.2 Yes
   2.3 No
   3. 4 2
   4. 3

---

[6] This content is available online at <http://cnx.org/content/m21125/1.1/>.

4.6.6 LEANER SECTION

4.6.7 Content

4.6.7.1 ACTIVITY: To use the vocabulary and properties of rotations to describe the relationships between 2-D shapes [LO 3.4]

1. Trace the following figures and cut them out neatly.

1.

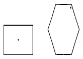


Figure 4.13

2.

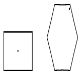


Figure 4.14

1.1 Determine how many times the design will fit into its outlines:
Figure 1: ____
Figure 2: ____
2. Determine whether the following figures have rotational symmetry:
2.1

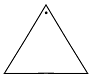


Figure 4.15

____

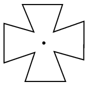


Figure 4.16

2.2

____

2.3

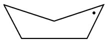


Figure 4.17

____

3. Complete : A square has an order of symmetry of ________________________

A rectangle has an order of symmetry of__________________________________

4. Does a triangle have rotational symmetry?________________________________

4.6.8 Assessment

Learning Outcome 3:The learner will be able to use appropriate measuring units, instruments and formulae in a variety of contexts.

Assessment Standard 3.4: We know this when the learner uses the vocabulary and properties of rotations, reflections and translations to describe the relationships between distinct two-dimensional shapes and three-dimensional objects within patterns (including transformations and symmetry).

4.7 To draw enlargements and reductions of 2-dimensional figures[7]

4.7.1 MATHEMATICS

4.7.2 Geometry

4.7.3 EDUCATOR SECTION

4.7.4 Memorandum

4.7.5 Learner Section

4.7.6 Content

4.7.6.1 ACTIVITY: To draw enlargements and reductions of 2-dimensional figures [LO 3.3.2, LO 3.5]

Sometimes it is necessary to enlarge or reduce a figure. Think of a picture you want to photostat that has to fit into a smaller space, or captions that you want to enlarge to use as directions against the passage wall.

---

[7] This content is available online at <http://cnx.org/content/m31673/1.1/>.

Let's see how you do it on your own!

1. Use grid paper and:

1.1 enlarge the square three times;

1.2 reduce the rectangle once;

1.3 double the size of the triangle.

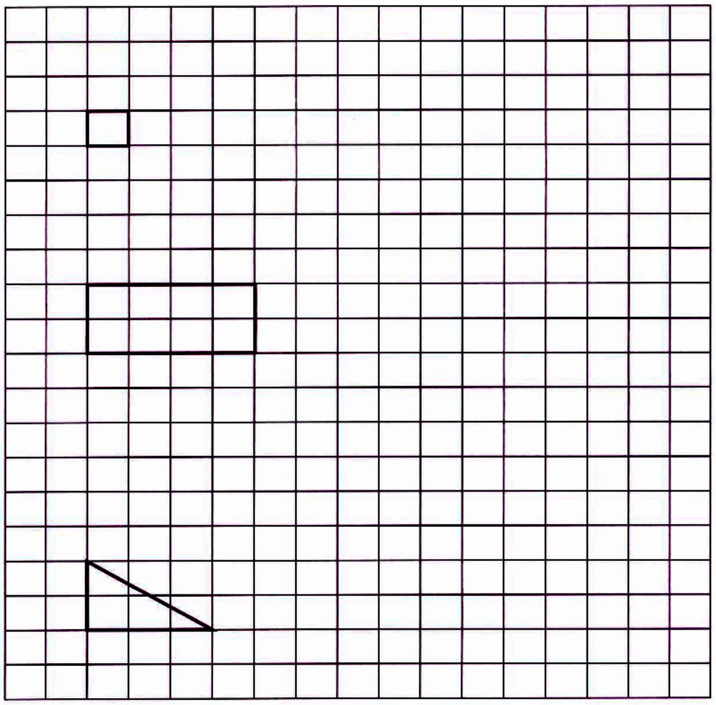


Figure 4.18

2. Now compare your drawings with the originals. What do you observe when you compare the shapes?

CHALLENGE!

Can you draw an exact copy of the elephant in the larger squares?

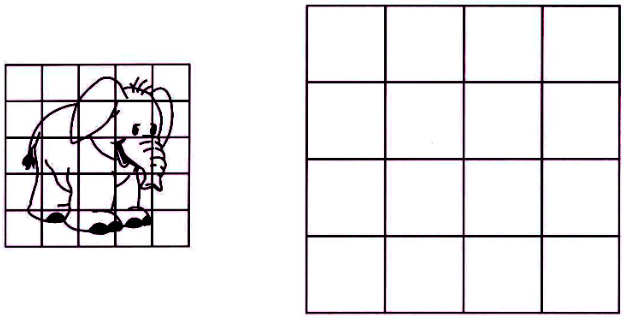


Figure 4.19

4.7.7 Assessment

Learning Outcome 3:The learner will be able to use appropriate measuring units, instruments and formulae in a variety of contexts.

Assessment Standard 3.3: We know this when the learner investigates and compares (alone or as a member of a group or team) two-dimensional shapes and three-dimensional objects studied in this grade according to properties listed above by:

3.3.2: drawing shapes on grid paper;

Assessment Standard 3.5: We know this when the learner draws enlargements and reductions of two-dimensional shapes (at least quadrilaterals and triangles), using grid paper to compare their size and shape.

4.8 To investigate and compare 2-dimensional figures[8]

4.8.1 MATHEMATICS

4.8.2 Geometry

4.8.3 EDUCATOR SECTION

4.8.4 Memorandum

1.
    1.1 Equally from centre
    2.
    2.1 180
    2.2 1
    2.3 360

---

[8] This content is available online at <http://cnx.org/content/m21129/1.1/>.

4.8.5 LEANER SECTION

4.8.6 Content

4.8.6.1 ACTIVITY: To investigate and compare 2-dimensional figures [LO 3.3.3]

Looking at circles:

1. Have a good look at the sketch and then answer the questions:

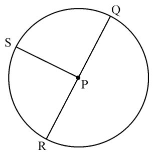


Figure 4.20

RQ = Diameter
SP = Radius
1.1 What is a circle?
____
1.2 Where do we come across circles in our daily lives?
____
____
2. Answer the following questions:
2.1 How many diameters could a circle have? ______________________________
2.2 How many centre points could a circle have? __________________________
2.3 How many radii could a circle have? _________________________________
3. Use a pair of compasses and draw a circle with a:
3.1 radius of 30 mm:
3.2 diameter of 80 mm:
DID YOU KNOW?
We can draw lovely patterns based on circles! The pattern shown below is known as a paisley design and is used on cloth or clothing.

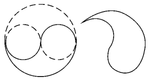


Figure 4.21

4. Can you find out how the pattern is created? Try to do it yourself!

5. Follow the steps and use this method for drawing the patterns that follow. Your educator will provide the paper that you need.

Draw a circle Use the same radius for marking the circumference Connect the points (if necessary)

Draw a circle

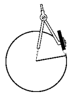


Figure 4.22

Use the same radius for marking the circumference

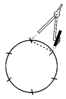


Figure 4.23

Connect the points (if necessary)

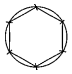


Figure 4.24

5.1

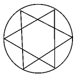


Figure 4.25

5.2

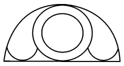


Figure 4.26

5.3

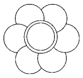


Figure 4.27

5.4

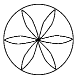


Figure 4.28

6. Design your own pattern with circles. Colour it neatly:

Time for self-assessment

It is important to know how well you understand the work that we have done up to now. Read the following criteria. Evaluate yourself on a scale ranging from 1 to 4 by circling the appropriate number.

Criteria	1 = Not at all.2 = Just a little.3 = Well.4 = Very well.				
I can explain the term "parallel".	1	2	3	4	

continued on next page

I can explain the difference between a line and a line segment.	1	2	3	4	
I can explain the following concepts:					
* acute angle;	1	2	3	4	
* obtuse angle;	1	2	3	4	
* right angle.	1	2	3	4	
I can use a protractor to:					
* measure angles accurately;	1	2	3	4	
* draw angles accurately.	1	2	3	4	
I can name the similarities between a rectangle and a parallelogram	1	2	3	4	
I can name the differences between a rectangle and a parallelogram.	1	2	3	4	
I can explain the concept "symmetrical".	1	2	3	4	
I can explain the concept "rotational symmetry".	1	2	3	4	

continued on next page

I can explain the following concepts:					
* radius;	1	2	3	4	
* diameter.	1	2	3	4	
I could enlarge and reduce the figures.	1	2	3	4	
I can use circles to draw patterns.	1	2	3	4	

Table 4.5

Let's look at 3-dimensional figures.

You probably quite often play games that require a die. See if you can make one yourself. Trace the outlines of the following net exactly. Cut it out neatly and fold it to form a die. Then write the numbers 1 to 6 on the sides. Remember that the numbers of the following number pairs (1,6), (3,4) and (2,5) must be on opposite sides.

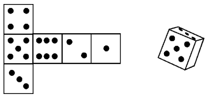


Figure 4.29

DID YOU KNOW?
The die that you have just made is an example of a cube.
Take a good look at the following:

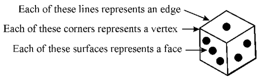

Each of these lines represents an edge
Each of these corners represents a vertex
Each of these surfaces represents a face

Figure 4.30

4.8.7 Assessment

Learning Outcome 3:The learner will be able to describe and represent characteristics and relationships between two-dimensional shapes and three-dimensional objects in a variety of orientations and positions.

Assessment Standard 3.3: We know this when the learner investigates and compares (alone or as a member of a group or team) two-dimensional shapes and three-dimensional objects studied in this grade according to properties listed above by:

3.3.3: using a pair of compasses to draw circles, patterns in circles, and patterns with circles.

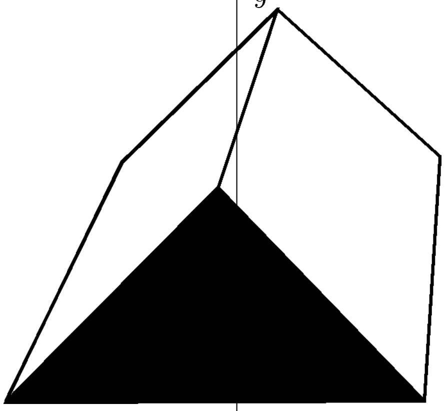
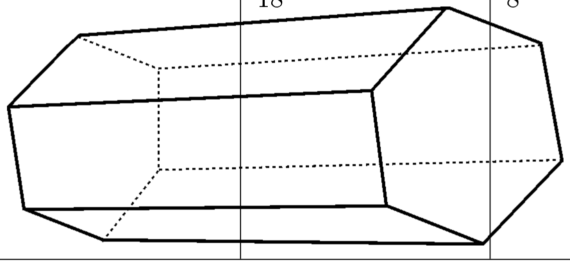
4.9 To describe and classify 3-dimensional figures[9]

4.9.1 MATHEMATICS

4.9.2 Geometry

4.9.3 EDUCATOR SECTION

4.9.4 Memorandum

	Figure	Number of edges	Number of faces	Number of vertices
1.		9	5	6
2.		18	8	12

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[9] This content is available online at <http://cnx.org/content/m21131/1.1/>.

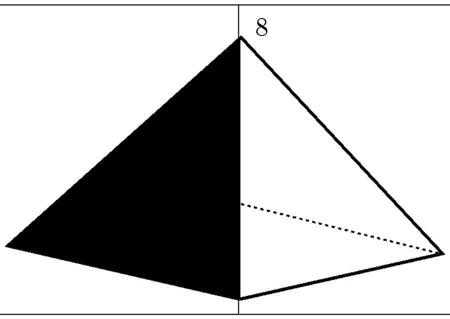
3.		8	5	5

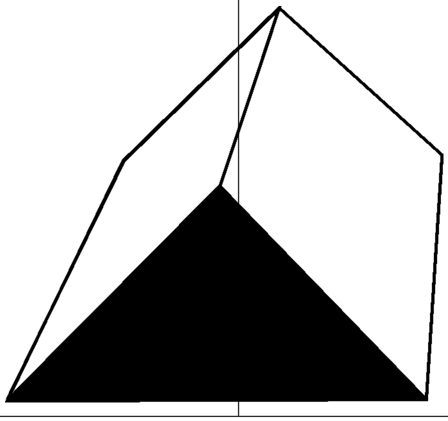
Table 4.6

4.9.5 LEANER SECTION

4.9.6 Content

4.9.6.1 ACTIVITY: To describe and classify 3-dimensional figures [LO 3.2.1]

Look at the following figures and complete the table:

	Figure	Number of edges	Number of faces	Number of vertices
1.				

continued on next page

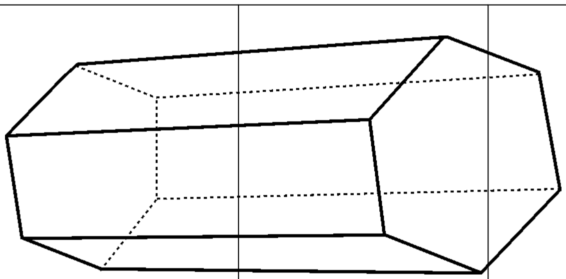
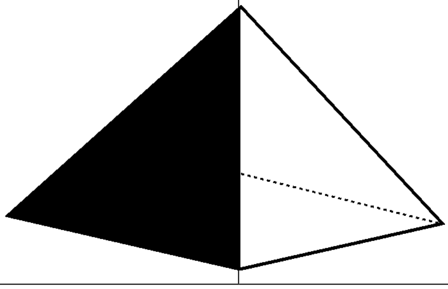
2.				
3.				

Table 4.7

4.9.7 Assessment

Learning Outcome 3:The learner will be able to describe and represent characteristics and relationships between two-dimensional shapes and three-dimensional objects in a variety of orientations and positions.

Assessment Standard 3.2: We know this when the learner describes and classifies two-dimensional shapes and three-dimensional objects in terms of properties including:

3.2.1: faces, vertices and edges.

4.10 To recognise, visualise and name 3-dimensional figures[10]

4.10.1 MATHEMATICS

4.10.2 Geometry

4.10.3 EDUCATOR SECTION

4.10.4 Memorandum

4.10.5 Learner Section

4.10.6 Content

4.10.6.1 ACTIVITY: To recognise, visualise and name 3-dimensional figures [LO 3.1.1]

4.10.6.2 To investigate and compare 3-dimensional figures [LO 3.3.1]

1. The following nets are examples of pyramids.
   Trace them exactly, cut them out and fold each pyramid.

---

[10] This content is available online at <http://cnx.org/content/m31674/1.1/>.

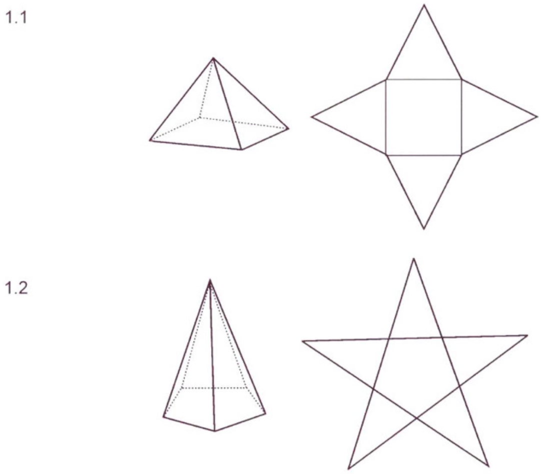


Figure 4.31

2. Hold a class discussion and draw up a list of the similarities and differences that you notice between the two pyramids.

4.10.7 Assessment

Learning Outcome 3:The learner will be able to describe and represent characteristics and relationships between two-dimensional shapes and three-dimensional objects in a variety of orientations and positions.

Assessment Standard 3.1: We know this when the learner recognises, visualises and names two-dimensional shapes and three-dimensional objects in natural and cultural forms and geometric settings, including those previously dealt with and focusing on:

3.1.1: similarities and differences between tetrahedrons and other pyramids.

Assessment Standard 3.3: We know this when the learner investigates and compares (alone or as a member of a group or team) two-dimensional shapes and three-dimensional objects studied in this grade according to properties listed above by:

3.3.1: making three-dimensional models using:

- drinking straws to make a skeleton,
- nets provided by the teacher;

4.11 To investigate and compare 3-dimensional figures[11]

4.11.1 MATHEMATICS

4.11.2 Geometry

4.11.3 EDUCATOR SECTION

4.11.4 Memorandum

2.1 3-dimensional One level
2.2 One level 3-dimensional

4.11.5 LEANER SECTION

4.11.6 Content

4.11.6.1 ACTIVITY: To investigate and compare 3-dimensional figures [LU 3.3.1]

Let's do some building!

1. Work with a partner. Use drinking straws or toothpicks and prestik and see whether you are able to build the following 3-dimensional figures:

1.1 a cube
1.2 a triangular prism
1.3 a pyramid
1.4 any other 3-dimensional figure

2. Now answer the following questions:

2.1 How does a cube differ from a square?

____
____
____
____

2.2 How does a triangle differ from a triangular prism?

____
____
____
____

4.11.7 Assessment

Learning Outcome 3:The learner will be able to describe and represent characteristics and relationships between two-dimensional shapes and three-dimensional objects in a variety of orientations and positions.

Assessment Standard 3.3: We know this when the learner investigates and compares (alone or as a member of a group or team) two-dimensional shapes and three-dimensional objects studied in this grade according to properties listed above by:

3.3.1: making three-dimensional models using:

- drinking straws to make a skeleton,
- nets provided by the teacher;

---

[11] This content is available online at <http://cnx.org/content/m21134/1.1/>.

4.12 To draw and interpret sketches[12]

4.12.1 MATHEMATICS

4.12.2 Geometry

4.12.3 EDUCATOR SECTION

4.12.4 Memorandum

1. 4
   2.
   2.1 19
   2.2 8

4.12.5 Learner Section

4.12.6 Content

4.12.6.1 ACTIVITY:To draw and interpret sketches [LO 3.7]

1. Take a good look at this sketch of a cube.
   How many squares are not visible when you view it from the front?

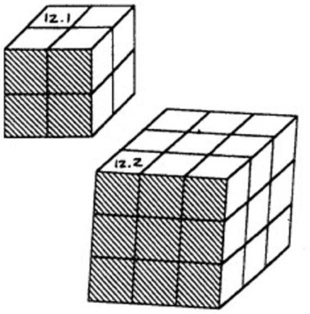


Figure 4.32

2. View the cube from the side.
2.1 How many cubes do you see?
____
2.2 How many cubes are invisible?
____
3. Now draw any one of these cubes from above.
CHALLENGE!
Ask your educator for the sheet of paper that you will need.

- Take off one of your school shoes:
- Draw it from above.
- Draw it from the side.

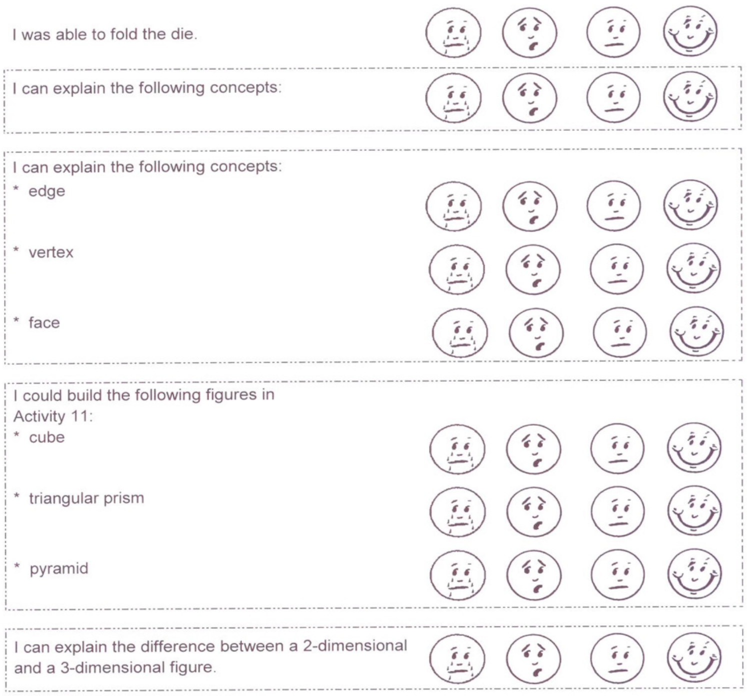
---

[12] This content is available online at <http://cnx.org/content/m31683/1.1/>.

- Draw it from below.

Time for self-assessment

Read the criteria. How do you feel about the work that we have just completed? Colour the face that is true for you.



I was able to fold the die.

I can explain the following concepts:

I can explain the following concepts:
* edge
* vertex
* face

I could build the following figures in Activity 11:
* cube
* triangular prism
* pyramid

I can explain the difference between a 2-dimensional and a 3-dimensional figure.

Figure 4.33

DID YOU KNOW?
We can make use of co-ordinates when we need to read a map or directions. It is important to know that we always have to read the horizontal axis first.
In this example, point A reads as paired numbers (1,2).
If you read the pair (3,1), you will arrive at B.
Sometimes direction is also given, and then it is: (1E, 2N) or (3E, 1N).

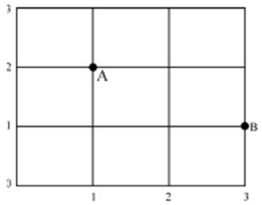


Figure 4.34

4.12.7 Assessment

Learning Outcome 3: The learner will be able to describe and represent characteristics and relationships between two-dimensional shapes and three-dimensional objects in a variety of orientations and positions.

Assessment Standard 3.7: We know this when the learner draws and interprets sketches of simple three-dimensional objects from different positions (perspectives).

4.13 To find specific positions and explaining how to move between positions[13]

4.13.1 MATHEMATICS

4.13.2 Geometry

4.13.3 EDUCATOR SECTION

4.13.4 Memorandum

1.
    1.1 Church
    1.2 Movies
    1.3 Factory
    1.4 Museum
    2.
    2.1 2 N and 8 W
    2.2 1N and 6 W
    2.3 3N and 5W
    2.4 1N and 8E

4.13.5 LEANER SECTION

4.13.6 Content

4.13.6.1 ACTIVITY: To find specific positions and explaining how to move between positions [LO 3.8]

1. Nino is a stranger to the town. Explain what he will see if he visits the following "points".

---

[13] This content is available online at <http://cnx.org/content/m21140/1.1/>.

1.1 (6E, 1S) : ____
1.2 (3W, 3N) : ____
1.3 (5W, 3S) : ____
1.4 (5E, 7N) : ____

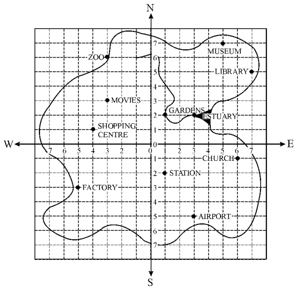


Figure 4.35

2. Using co-ordinates only, tell Nino how to get:
2.1 from the airport to the factory:
____
2.2 from the estuary to the movies:
____
2.3 from the station to the shopping centre:
____
2.4 from the zoo to the museum:
____

CHALLENGE!

Design a map of your own, with directions. Bury a treasure somewhere and use co-ordinates to direct your partner to find it.

4.13.7 Assessment

Learning Outcome 3: The learner will be able to describe and represent characteristics and relationships between two-dimensional shapes and three-dimensional objects in a variety of orientations and positions.

Assessment Standard 3.8: We know this when the learner locates positions on a coded grid, describe how to move between positions on the grid, and recognises maps as grids.

4.14 To do mental calculations[14]

4.14.1 MATHEMATICS

4.14.2 Data Handling

4.14.3 EDUCATOR SECTION

4.14.4 Memorandum

1.1 $9 \times 12 = \mathbf{108}$
1.2 $7 \times 8 = \mathbf{56}$
1.3 $6 \times \mathbf{8} = 48$
1.4 $\mathbf{13} \times 5 = 65$
1.5 $(4 \times 6) + 18 = \mathbf{42}$
1.6 $(4 \times \mathbf{8}) + 8 = 40$
1.7 $\mathbf{144} \div 12 \div 6 = 2$
1.8 2 004 – 13 = **1991**
1.9 $54 \div \mathbf{6} = 9$
1.10 $\mathbf{63} \div 7 = 9$
1.11 $132 \div 12 = \mathbf{11}$
1.12 $4 \times 4 \times 4 = \mathbf{64}$
1.13 $72 \div \mathbf{9} = 8$
1.14 $(\mathbf{81} \div 9) \times 4 = 36$
1.15 $15 \times 7 \times 6 \times \mathbf{0} = 0$

4.14.5 LEANER SECTION

4.14.6 Content

4.14.6.1 ACTIVITY: To do mental calculations [LO 1.9]

1. It has been a long time since we checked to see how good your mental arithmetic skills are! See if you can complete the following mental arithmetic test within two minutes:

1.1 $9 \times 12 =$
1.2 $7 \times 8 =$
1.3 $6 \times \; = 48$
1.4 $\times 5 = 65$
1.5 $(4 \times 6) + 18 =$
1.6 $(4 \times \;) + 8 = 40$
1.7 $\div 12 \div 6 = 2$
1.8 2 004 – 13 =
1.9 $54 \div \; = 9$
1.10 $\div 7 = 9$
1.11 $132 \div 12 =$
1.12 $4 \times 4 \times 4 =$
1.13 $72 \div \; = 8$
1.14 $(\; \div 9) \times 4 = 36$
1.15 $15 \times 7 \times 6 \times \; = 0$
Fill in: I got ____ correct!

---

[14] This content is available online at <http://cnx.org/content/m21144/1.1/>.

4.14.7 Assessment

Learning Outcome 1:The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.9: We know this when the learner performs mental calculations.

4.15 To use simple tables to collect data and answer questions[15]

4.15.1 MATHEMATICS

4.15.2 Data Handling

4.15.3 EDUCATOR SECTION

4.15.4 Memorandum

4.15.5 LEANER SECTION

4.15.6 Content

4.15.6.1 ACTIVITY: To use simple tables to collect data and answer questions [LU 5.2]

4.15.6.2 To organise and record data [LU 5.4]

1. Let's do a survey of the results obtained by the class in the mental arithmetic test. Complete the following simple table:

Number of questions answered correctly	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	1
Number of learners	__	__	__	__	__	__	__	__	__	__	__	__	__	__	__	__

Table 4.8

2. Answer the following questions according to the above table:
2.1 How many learners wrote the mental arithmetic test? ______________________
2.2 How many learners attained full marks? ____________________________________
2.3 How many learners only answered 8 questions correctly? ___________________
2.4 How many questions were answered correctly by most of the learners? _____
2.5 Was it an easy mental arithmetic test? _____________________________________
Motivate your answer: ____
____
CLASS DISCUSSION
Discuss the following and see if you can arrive at answers.

---

[15] This content is available online at <http://cnx.org/content/m31675/1.1/>.

1. Why do you think it is important for your principal to know exactly how many learners will be in each class next year?
2. Why do you think it is important to know how many people there are in a town?
3. How could one obtain the above information?

4.15.7 Assessment

Learning Outcome 5:The learner will be able to collect, summarise, display and critically analyse data in order to draw conclusions and make predictions, and to interpret and determine chance variation.

Assessment Standard 5.2: We know this when the learner uses simple data collection sheets (requiring tallies) and simple questionnaires (with yes/no type responses) in order to collect data (alone or as a member of a group or team) to answer questions posed by the teacher, class and self,

Assessment Standard 5.4: We know this when the learner organises and records data, using tallies and tables.

4.16 To ask simple questions and identify sources of data[16]

4.16.1 MATHEMATICS

4.16.2 Geometry

4.16.3 EDUCATOR SECTION

4.16.4 Memorandum

4.16.5 Learner Section

4.16.6 Content

4.16.6.1 ACTIVITY: To draw enlargements and reductions of 2-dimensional figures [LO 3.3.2, LO 3.5]

For this activity you must divide into three groups. Choose one of the following subjects. Then choose one class in the school from whom you can collect the information.

- Favourite sport
- Favourite TV programme
- Favourite learning area at school
- Favourite pet
- Favourite weekend pastime

Compile a table to record the information, e.g.:

Favourite sport	Hockey	Netball	Soccer	Rugby
Number of Learners				

Table 4.9

---

[16] This content is available online at <http://cnx.org/content/m31676/1.1/>.

4.16.7 Assessment

Learning Outcome 5:The learner will be able to collect, summarise, display and critically analyse data in order to draw conclusions and make predictions, and to interpret and determine chance variation.

Assessment Standard 5.1: We know this when the learner poses simple questions about own school and family environment, and identifies appropriate data sources in order to address human rights, social, political, cultural, environmental and economic issues in that environment;

Assessment Standard 5.4: We know this when the learner organises and records data, using tallies and tables.

4.17 To draw a number of different graphs[17]

4.17.1 MATHEMATICS

4.17.2 Geometry

4.17.3 EDUCATOR SECTION

4.17.4 Memorandum

4.17.5 Learner Section

4.17.6 Content

4.17.6.1 ACTIVITY: To draw a number of different graphs [LO 5.6]

We can represent the information we collect in a wide variety of ways, such as block graphs, bar graphs, line graphs, pictographs and pie graphs.

Let us have a look at a number of examples:

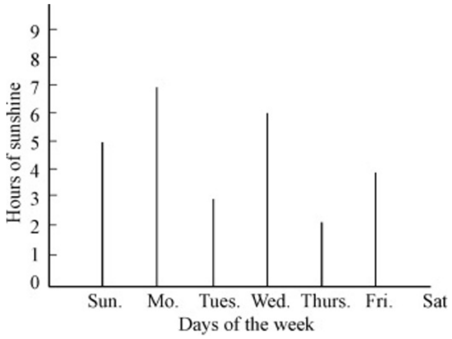


Figure 4.36

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[17] This content is available online at <http://cnx.org/content/m31678/1.1/>.

4.17.6.1.1 Bar line graph

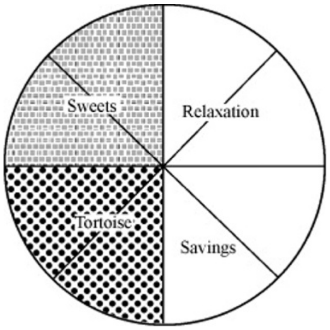

Figure 4.37

4.17.6.1.2 Circle diagram

4.17.7

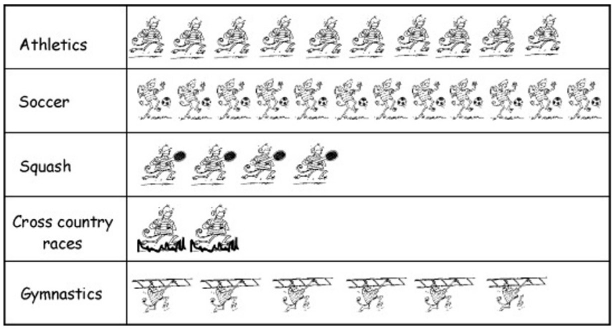

Figure 4.38

4.17.8

4.17.9

4.17.10

4.17.11

Pictogram

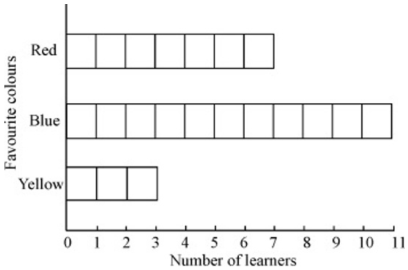

Figure 4.39

A horizontal block graph

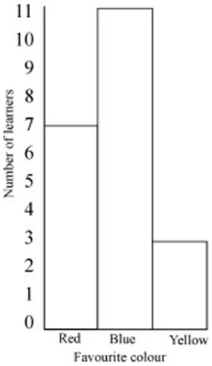

Figure 4.40

A vertical bar graph

1. Now choose one of these graphs and present the information collected in the previous module neatly.

Figure 4.41

Assessment: Graph

Criteria	1	2	3	4
Axis	No axis has a caption.	Only one axis has a caption.	Both axes have captions but not correctly.	Both axes have correct and neat captions.
Graph	Interpretation almost impossible.	Interpretation difficult and the data is unorganised.	Graph can be interpreted but is not 100% correct.	The graph is organised and data presented meaningfully. Easy to interpret.
Neatness	Work is untidy and unorganised.	Organised but difficult to read.	Neat, organised and easy to read.	Neat, clearly set out and very easy to read.

Table 4.10

4.17.12 Assessment

Learning Outcome 5:The learner will be able to collect, summarise, display and critically analyse data in order to draw conclusions and make predictions, and to interpret and determine chance variation.

Assessment Standard 5.6: We know this when the learner draws a variety of graphs by hand/technology to display and interpret data (grouped and ungrouped).

4.18 To read and interpret data critically[18]

4.18.1 MATHEMATICS

4.18.2 Geometry

4.18.3 EDUCATOR SECTION

4.18.4 Memorandum

1.
    - 1.1 4
    - 1.2 e.TV
    - 1.3 Egoli
    - 1.4 2 / 3
    - 1.5 Hooked on Golf
    - 1.6 14:00 en 17:00
    - 1.7 SABC 3 and e.TV
    - 1.8 Which of these TV Channels is your favourite? Why?

4.18.5 Learner Section

4.18.6 Content

4.18.6.1 ACTIVITY: To read and interpret data critically [LO 5.7.1]

1. You have drawn your own graph, now let us see if you are able to interpret data that is presented in another way. Look carefully at the following and answer the questions that follow:

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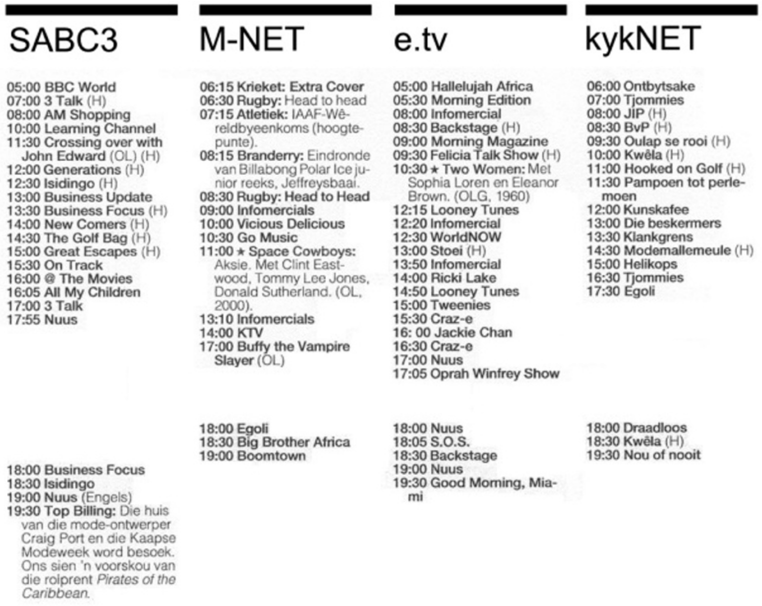
[18] This content is available online at <http://cnx.org/content/m31679/1.1/>.



SABC3

05:00 BBC World
07:00 3 Talk (H)
08:00 AM Shopping
10:00 Learning Channel
11:30 Crossing over with John Edward (OL) (H)
12:00 Generations (H)
12:30 Isidingo (H)
13:00 Business Update
13:30 Business Focus (H)
14:00 New Comers (H)
14:30 The Golf Bag (H)
15:00 Great Escapes (H)
15:30 On Track
16:00 @ The Movies
16:05 All My Children
17:00 3 Talk
17:55 Nuus

18:00 Business Focus
18:30 Isidingo
19:00 Nuus (Engels)
19:30 Top Billing: Die huis van die mode-ontwerper Craig Port en die Kaapse Modeweek word besoek. Ons sien 'n voorskou van die rolprent *Pirates of the Caribbean.*

M-NET

06:15 Krieket: Extra Cover
06:30 Rugby: Head to head
07:15 Atletiek: IAAF-Wêreldbyeenkoms (hoogtepunte).
08:15 Branderry: Eindronde van Billabong Polar Ice junior reeks, Jeffreysbaai.
08:30 Rugby: Head to Head
09:00 Infomercials
10:00 Vicious Delicious
10:30 Go Music
11:00 ★ Space Cowboys: Aksie. Met Clint Eastwood, Tommy Lee Jones, Donald Sutherland. (OL, 2000).
13:10 Infomercials
14:00 KTV
17:00 Buffy the Vampire Slayer (OL)

18:00 Egoli
18:30 Big Brother Africa
19:00 Boomtown

e.tv

05:00 Hallelujah Africa
05:30 Morning Edition
08:00 Infomercial
08:30 Backstage (H)
09:00 Morning Magazine
09:30 Felicia Talk Show (H)
10:30 ★ Two Women: Met Sophia Loren en Eleanor Brown. (OLG, 1960)
12:15 Looney Tunes
12:20 Infomercial
12:30 WorldNOW
13:00 Stoei (H)
13:50 Infomercial
14:00 Ricki Lake
14:50 Looney Tunes
15:00 Tweenies
15:30 Craz-e
16: 00 Jackie Chan
16:30 Craz-e
17:00 Nuus
17:05 Oprah Winfrey Show

18:00 Nuus
18:05 S.O.S.
18:30 Backstage
19:00 Nuus
19:30 Good Morning, Miami

kykNET

06:00 Ontbytsake
07:00 Tjommies
08:00 JIP (H)
08:30 BvP (H)
09:30 Oulap se rooi (H)
10:00 Kwêla (H)
11:00 Hooked on Golf (H)
11:30 Pampoen tot perlemoen
12:00 Kunskafee
13:00 Die beskermers
13:30 Klankgrens
14:30 Modemallemeule (H)
15:00 Helikops
16:30 Tjommies
17:30 Egoli

18:00 Draadloos
18:30 Kwêla (H)
19:30 Nou of nooit

Figure 4.42

1.1 Programmes from how many different TV channels are presented here?

____

1.2 On which channel will you be able to see the movie "Two Women"?

____

1.3 Which programme are you able to see on both M-Net and kykNet?

____

1.4 How many SABC 3 programmes are repeated?

____

1.5 Which sports programme are you able to watch on kykNet?

____

1.6 At what time is there a children's programme on M-Net?

____

1.7 Which channel begins their transmission earliest?

____

1.8 Which of these TV Channels is YOUR favourite?

____

Why?

____

4.18.7 Assessment

Learning Outcome 5:The learner will be able to collect, summarise, display and critically analyse data in order to draw conclusions and make predictions, and to interpret and determine chance variation.

Assessment Standard 5.7: We know this when the learner critically reads and interprets data presented in a variety of ways (including own representations, representations in the media - words, graphs, pie graphs)

to draw conclusions and make predictions sensitive to the role of:
5.7.1: context (e.g. rural or urban, national or provincial).

4.19 To examine ungrouped numerical data to determine the mode and the median[19]

4.19.1 MATHEMATICS

4.19.2 Data Handling

4.19.3 EDUCATOR SECTION

4.19.4 Memorandum

1. 1.1 45
   - 45
   - 41,5
2. 2.1 18 / 13
   - 6
3. 3.1 17 / 19
   - 38
4. 4.1 5,5
   - 13,7
5. 5.1 Class / Subject

4.19.5 LEANER SECTION

4.19.6 Content

4.19.6.1 ACTIVITY: To examine ungrouped numerical data to determine the mode and the median [LO 5.5]

By this time you will have realised that data can be represented in numerous ways. Let us see how data can be used within the school situation:

Mr Marvin's class has written a Mathematics test for a total of 50 marks and the boys' results are as follows:

47 ; 33 ; 45 ; 49 ; 38 ; 45 ; 42 ; 45 ; 30

Instead of representing the data by means of a graph, Mr Marvin has calculated the mode, median and arithmetical average.

DID YOU KNOW?

The mode of the data is the value that appears most often.

Sometimes there is more than one mode.

The median of the data is the value in the middle when the data is
arranged from small to big.

If there is an equal number of values, the median is the average of the two

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[19] This content is available online at <http://cnx.org/content/m21845/1.1/>.

middle numbers.
The arithmetical average is what you get when all the values are added together and divided by the number of values.

1. Let us help Mr Marvin calculate the following:
1.1 The mode:
____
____
____
1.2 The median:
____
____
____
1.3 The arithmetical average:
____
____
____
2. Determine the mode of:
2.1 18 ; 13 ; 15 ; 18 ; 19 ; 12 ; 13 ; 14
2.2 5 ; 6 ; 6 ; 7 ; 9 ; 8 ; 7 ; 6 ; 8 ; 9
3. Determine the median of:
3.1 17 ; 15 ; 23 ; 15 ; 19 ; 29
3.2 41 ; 29 ; 50 ; 33 ; 45 ; 27 ; 38
4. Determine the arithmetical average of:
4.1 5 ; 7 ; 8 ; 3 ; 4 ; 9 ; 2 ; 6
4.2 11 ; 14 ; 16 ; 12 ; 13 ; 15 ; 15
5. Answer the following questions:
5.1 What arithmetical average does your educator determine regularly?
____
____
____
5.2 Why?
____
____
____

4.19.7 Assessment

Learning Outcome 5:The learner will be able to collect, summarise, display and critically analyse data in order to draw conclusions and make predictions, and to interpret and determine chance variation.

Assessment Standard 5.5: We know this when the learner examines ungrouped numerical data to determine the most frequently occurring score (mode) and the midpoint (median) of the data set in order to describe central tendencies.

4.20 To ask simple questions and identifying sources of data[20]

4.20.1 MATHEMATICS

4.20.2 Geometry

4.20.3 EDUCATOR SECTION

4.20.4 Memorandum

4.20.5 Learner Section

4.20.6 Content

4.20.6.1 ACTIVITY: To ask simple questions and identifying sources of data [LO 5.1]

4.20.6.2 To use simple tables to collect data and answer questions [LO 5.2]

4.20.6.3 To organise and record data [LO 5.4]

4.20.6.4 To examine ungrouped numerical data and determining the mode, median and arithmetical average [LO 5.5]

4.20.6.5 To draw a variety of graphs [LO 5.6]

4.20.6.6 To read and interpret data critically [LO 5.7.2]

**This is an assignment for your portfolio. Read the instructions attentively before you begin working.

1. Record the shoe sizes of all the children in any clqss (besides your own) in the school
2. Present the information neatly in a table
3. Now present the information by means of a graph of your own choice
4. Determine the mode of the data
5. Determine the arithmetical average
6. Note down any interesting facts about the data that you have collected

Criteria	Code			
	1	2	3	4
Completion	Hardly any of the instructions have been carried out.	Half of the instructions have been carried out.	One or two instructions have not been carried out.	All instructions have been carried out.
Neatness and organisation	Work is untidy and unorganised.	Organised but difficult to read.	Neat, organised and easy to read.	Neat, clearly set out and very easy to read.

continued on next page

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[20] This content is available online at <http://cnx.org/content/m31680/1.1/>.

Graph	Virtually impossible to interpret.	Data unorganised and difficult to interpret.	Graph can be interpreted but is not 100% correct.	The graph is ordered and data presented meaningfully. Easy to interpret.
Correctness of calculations	All answers are incorrectly calculated.	Many mistakes made.	Few mistakes have been made.	All answers are correctly calculated.

Table 4.11

4.20.7 Assessment

Learning Outcome 5:The learner will be able to collect, summarise, display and critically analyse data in order to draw conclusions and make predictions, and to interpret and determine chance variation.

Assessment Standard 5.1: We know this when the learner poses simple questions about own school and family environment, and identifies appropriate data sources in order to address human rights, social, political, cultural, environmental and economic issues in that environment;

Assessment Standard 5.2: We know this when the learner uses simple data collection sheets (requiring tallies) and simple questionnaires (with yes/no type responses) in order to collect data (alone or as a member of a group or team) to answer questions posed by the teacher, class and self;

Assessment Standard 5.4: We know this when the learner organises and records data, using tallies and tables;

Assessment Standard 5.5: We know this when the learner examines ungrouped numerical data to determine the most frequently occurring score (mode) and the midpoint (median) of the data set in order to describe central tendencies;

Assessment Standard 5.6: We know this when the learner draws a variety of graphs by hand/technology to display and interpret data (grouped and ungrouped);

Assessment Standard 5.7: We know this when the learner critically reads and interprets data presented in a variety of ways (including own representations, representations in the media - words, graphs, pie graphs) to draw conclusions and make predictions sensitive to the role of:

5.7.2: categories (e.g. age, gender, race).

4.21 To predict the likelihood of events in everyday life[21]

4.21.1 MATHEMATICS

4.21.2 Probability

4.21.3 EDUCATOR SECTION

4.21.4 Memorandum

1.
    1.1 Possible
    1.2 Possible
    1.3 Certain
    1.4 Possible
    1.5 Impossible
    1.6 Possible

---

[21] This content is available online at <http://cnx.org/content/m21844/1.1/>.

1.7 Impossible
1.8 Impossible
1.9 Certain
1.10 Possible

4.21.5 LEANER SECTION

4.21.6 Content

4.21.6.1 ACTIVITY: To predict the likelihood of events in everyday life [LO 5.8]

1. Work with a friend. Decide whether the following is certain, possible or impossible. Put a tick in the appropriate column:

		Certain	Possible	Impossible
1.1	It will rain on Wednesday.			
1.2	If you throw a die, it will land on 3.			
1.3	Sunday comes before Monday.			
1.4	The netball team will win their game.			
1.5	You can fly from Durban to Cape Town in 15 minutes.			
1.6	I will get full marks for my next test.			
1.7	There will be no school holidays next year.			
1.8	I will turn 10 on my next birthday.			
1.9	Thursday comes before Wednesday.			
1.10	I am going to win R1 000.00.			

Table 4.12

DID YOU KNOW?

4 You were actually estimating the probability of things happening or not. We can link numbers to the estimations.

A probability of one means that the event will definitely take place.

A probability of nought means that the event will definitely not take place.

We can determine the probability of something taking place as follows:

The number of times that the event can take place

Total number of possibilities

The probability of taking a red ball out of a container holding 2 red and 3 blue balls

therefore is:

(there are 2 red balls)

(there are 5 balls altogether)

4.21.7 Assessment

Learning Outcome 5:The learner will be able to collect, summarise, display and critically analyse data in order to draw conclusions and make predictions, and to interpret and determine chance variation.

Assessment Standard 5.8: We know this when the learner predicts the likelihood of events in daily life based on observation, and places them on a scale from 'impossible' to 'certain'.

4.22 To list possible outcomes to simple experiments[22]

4.22.1 MATHEMATICS

4.22.2 Probability

4.22.3 EDUCATOR SECTION

4.22.4 Memorandum

1. $\frac{2}{12}\frac{1}{6}$
2. $\frac{4}{6}=\frac{2}{3}$
3. $\frac{6}{16}=\frac{3}{8}$
4. $\frac{1}{2}$
5. $\frac{4}{5}$

4.22.5 LEANER SECTION

4.22.6 Content

4.22.6.1 ACTIVITY: To list possible outcomes to simple experiments [LO 5.9]

Determine the probability in the following cases:

1. Two dice are rolled simultaneously. What is the probability of one die landing on 1?

_ _

_ _

2. There are two pairs of white and one pair of black socks in my drawer. What is the probability of taking out a white sock without looking?

_ _

_ _

3. There are five forks, five knives and six spoons lying together in the cutlery drawer. What is the probability of taking out a spoon?

_ _

_ _

4. What is the probability of a coin landing on 'tails' when tossed into the air?

_ _

_ _

5. Look at the following sketch. What is the probability of the pointer not stopping on P when it is spun?

_ _

_ _

---

[22] This content is available online at <http://cnx.org/content/m21843/1.1/>.

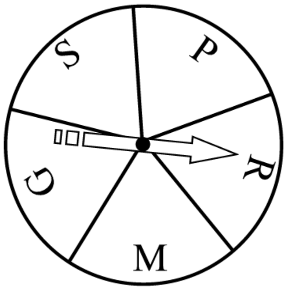


Figure 4.43

4.22.7 Assessment

Learning Outcome 5:The learner will be able to collect, summarise, display and critically analyse data in order to draw conclusions and make predictions, and to interpret and determine chance variation.

Assessment Standard 5.9: We know this when the learner lists possible outcomes for simple experiments (including tossing a coin, rolling a die, and spinning a spinner);

4.23 To count the frequency of actual outcomes for a series of trials[23]

4.23.1 MATHEMATICS

4.23.2 Geometry

4.23.3 EDUCATOR SECTION

4.23.4 Memorandum

4.23.5 Learner Section

4.23.6 Content

4.23.6.1 ACTIVITY: To count the frequency of actual outcomes for a series of trials [LO 5.10]

1. Work with a friend. Throw a die 20 times and record each time that it lands on a 4.

Fill in: number of times: ____

2. Work with a friend. Toss a coin into the air 20 times and note each time it falls on 'heads'.

Fill in: number of times: ____

DID YOU KNOW?

The number of times that were recorded above is referred to as the relative frequency.

If the 4 had shown up 9 times in the above example, we would calculate the relative frequency as follows:

Relative frequency =

number of fours

number of throws

$$= \frac{9}{20} \tag{4.1}$$

---

[23] This content is available online at <http://cnx.org/content/m31681/1.1/>.

3. Throw the die 30 times and see how often it lands on 2.
   Calculate the relative frequency.

   ____
   ____
   ____
   ____
   ____

Time For Self-Assessment

It is important to know if you have understood the last part of the work. Read the criteria below. Evaluate yourself on a scale of 1-4 by circling the appropriate number.

Criteria	1 = Not at all.2 = Just a little.3 = Well.4 = Very well.				
I am able to explain the concept of "probability".	1	2	3	4	
I can explain what a probability of one means.	1	2	3	4	
I can explain what a probability of nought means.	1	1	1	1	
I can determine probability correctly.	1	2	3	4	
I can determine relative frequency correctly.	1	2	3	4	

Table 4.13

4.23.7 Assessment

Learning Outcome 5:The learner will be able to collect, summarise, display and critically analyse data in order to draw conclusions and make predictions, and to interpret and determine chance variation.

Assessment Standard 5.10: We know this when the learner counts the frequency of actual outcomes for a series of trials.

4.24 To do mental arithmetic[24]

4.24.1 MATHEMATICS

4.24.2 Probability

4.24.3 EDUCATOR SECTION

4.24.4 Memorandum

1. $6 \times 7 = \mathbf{42}$

2. $7 \times 9 = \mathbf{63}$
3. $6 \times \mathbf{7} = 42$
4. $\mathbf{9} \times 5 = 45$
5. $(4 \times 12) + 13 = \mathbf{61}$
6. $(6 \times \mathbf{8}) + 8 = 56$
7. $\mathbf{144} \div 12 \div 6 = 2$
8. $2\ 001 - 17 = \mathbf{1\ 984}$
9. $72 \div \mathbf{8} = 9$
10. $\mathbf{24} \div 3 = 8$
11. $132 \div 11 = \mathbf{12}$
12. $3 \times 3 \times 3 = \mathbf{27}$
13. $96 \div \mathbf{12} = 8$
14. $(\mathbf{30} \div 6) \times 4 = 20$
15. $13 \times 4 \times 8 \times \mathbf{0} = 0$

TEST

1.

1.1 straight angle

1.2 obtuse angle

1.3 acute angle

2.

- 40º
- 150º

3.

3.1 No

3.2 Yes

4. 8 ; 8 ; 6

5. The ages of ten teachers are as follows:

23 ; 23 ; 29 ; 35 ; 41 ; 42 ; 42 ; 42 ; 47 , 53

5.1 42

5.2 41 / 42

5.3 37 ,7

6. Total number of times it took place

Total number of posibilities

7.

7.1 $\frac{7}{17}$

7.2 $\frac{7}{27}$

---

[24] This content is available online at <http://cnx.org/content/m21842/1.1/>.

4.24.5 LEANER SECTION

4.24.6 Content

4.24.7 ACTIVITY: To do mental arithmetic [LO 1.9]

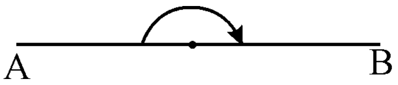
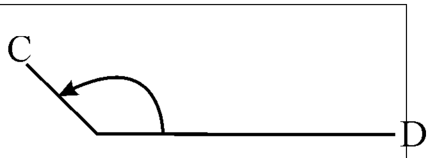
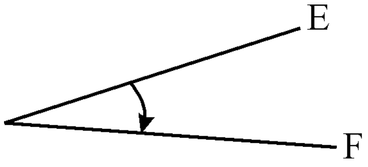
Let's round off the year's work with our last mental arithmetic test. Test your skill by answering the following questions as quickly and correctly as possible:

1. 6 × 7 = ________________________
2. 7 × 9 =________________________
3. 6 × ________________________ = 42
4. ________________________ × 5 = 45
5. (4 × 12) + 13 = ________________________
6. (6 × ________________________) + 8 = 56
7. ________________________ ÷ 12 ÷ 6 = 2
8. 2 001 − 17 = ________________________
9. 72 ÷ ________________________ = 9
10. ________________________ ÷ 3 = 8
11. 132 ÷ 11 = ________________________
12. 3 × 3 × 3 = ________________________
13. 96 ÷ ________________________ = 8
14. (________________________ ÷ 6) × 4 = 20
15. 13 × 4 × 8 × ________________________ = 0

Complete: I had ________________________ correct!

TEST

1. What kind of angles are the following?

 1.1		 1.2
____		________________________________
 1.3		
		continued on next page

____________________	____________________	____________________

Table 4.14

(3)
2. Measure the following angles with your protractor:

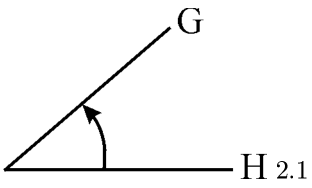
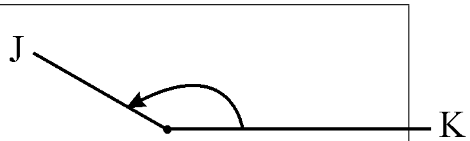
 2.1		 2.2
____________________	____________________	____________________

Table 4.15

(2)
3. Do the following figures have rotational symmetry?

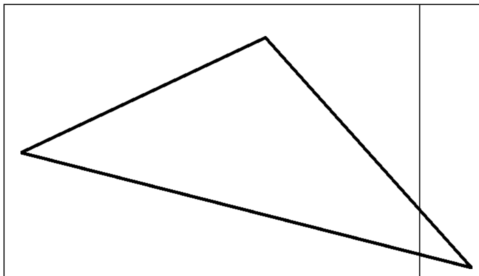
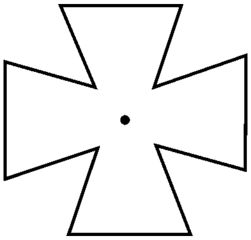
 3.1		 3.2
____________________	____________________	____________________

Table 4.16

(2)
4. Complete: A cube has __________________ edges; ___________________ angular points and ____ faces.
(3)
5. The ages of ten teachers are as follows:
35 ; 41 ; 23 ; 42 ; 42 ; 53 ; 47 ; 42 ; 23 , 29
5.1 Determine the mode:
____
____
____
(1)
5.2 Determine the median:
____
____
____
(2)

5.3 Determine the arithmetical average:

____

____

____

(3)

6. What “formula” is used to determine possibility?

____

____

____

(2)

7.

7.1 What is the probability that I will take a green ball out of a basket with 7 green, 6 red, and 4 yellow balls?

____

____

____

(1)

7.2 What is the probability that I will take a yellow Smartie from a container with
5 green, 9 blue, 7 yellow, 2 pink and 4 red Smarties?

____

____

____

(1)

4.24.7.1 Assessment

Learning Outcome 1:The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.9: We know this when the learner performs mental calculations.

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